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CAMBOARD Electronics

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User's Manual

IPL T S Series

IP Link Tools

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Precautions

Safety Instructions • English

This symbol is intended to alert the user of important operating and maintenance (servicing) instructions in the literature provided with the equipment.

This symbol is intended to alert the user of the presence of uninsulated dangerous voltage within the product's enclosure that may present a risk of electric shock.

Caution

Read Instructions • Read and understand all safety and operating instructions before using the equipment.

Retain Instructions • The safety instructions should be kept for future reference.

Follow Warnings • Follow all warnings and instructions marked on the equipment or in the user information.

Avoid Attachments • Do not use tools or attachments that are not recommended by the equipment manufacturer because they may be hazardous.

Consignes de Sécurité • Français

Ce symbole sert à avertir l'utilisateur que la documentation fournie avec le matériel contient des instructions importantes concernant l'exploitation et la maintenance (réparation).

Ce symbole sert à avertir l'utilisateur de la présence dans le boîtier de l'appareil de tensions dangereuses non isolées posant des risques d'électrocution.

Attention

Lire les instructions• Prendre connaissance de toutes les consignes de sécurité et d'exploitation avant d'utiliser le matériel.

Conserver les instructions• Ranger les consignes de sécurité afin de pouvoir les consulter à l'avenir.

Respecter les avertissements • Observer tous les avertissements et consignes marqués sur le matériel ou présentés dans la documentation utilisateur.

Eviter les pièces de fixation • Ne pas utiliser de pièces de fixation ni d'outils non recommandés par le fabricant du matériel car cela risquerait de poser certains dangers.

Sicherheitsanleitungen • Deutsch

Dieses Symbol soll dem Benutzer in der im Lieferumfang enthaltenen Dokumentation besonders wichtige Hinweise zur Bedienung und Wartung (Instandhaltung) geben.

Dieses Symbol soll den Benutzer darauf aufmerksam machen, daß im Inneren des Gehäuses dieses Produktes gefährliche Spannungen, die nicht isoliert sind und die einen elektrischen Schock verursachen können, herrschen.

Achtung

Lesen der Anleitungen • Bevor Sie das Gerät zum ersten Mal verwenden, sollten Sie alle Sicherheits-und Bedienungsanleitungen genau durchlesen und verstehen.

Aufbewahren der Anleitungen • Die Hinweise zur elektrischen Sicherheit des Produktes sollten Sie aufbewahren, damit Sie im Bedarfsfall darauf zurückgreifen können.

Befolgen der Warnhinweise • Befolgen Sie alle Warnhinweise und Anleitungen auf dem Gerät oder in der Benutzerdokumentation.

Keine Zusatzgeräte • Verwenden Sie keine Werkzeuge oder Zusatzgeräte, die nicht ausdrücklich vom Hersteller empfohlen wurden, da diese eine Gefahrenquelle darstellen können.

Instrucciones de seguridad • Español

Este símbolo se utiliza para advertir al usuario sobre instrucciones importantes de operación y mantenimiento (o cambio de partes) que se desean destacar en el contenido de la documentación suministrada con los equipos.

Este símbolo se utiliza para advertir al usuario sobre la presencia de elementos con voltaje peligroso sin protección aislante, que puedan encontrarse dentro de la caja o alojamiento del producto, y que puedan representar riesgo de electrocución.

Precaucion

Leer las instrucciones • Leer y analizar todas las instrucciones de operación y seguridad, antes de usar el equipo.

Conservar las instrucciones • Conservar las instrucciones de seguridad para futura consulta.

Obedecer las advertencias • Todas las advertencias e instrucciones marcadas en el equipo o en la documentación del usuario, deben ser obedecidas.

Evitar el uso de accesorios • No usar herramientas o accesorios que no sean especificamente recomendados por el fabricante, ya que podrian implicar riesgos.

Warning

Power sources • This equipment should be operated only from the power source indicated on the product. This equipment is intended to be used with a main power system with a grounded (neutral) conductor. The third (grounding) pin is a safety feature, do not attempt to bypass or disable it.

Power disconnection • To remove power from the equipment safely, remove all power cords from the rear of the equipment, or the desktop power module (if detachable), or from the power source receptacle (wall plug).

Power cord protection • Power cords should be routed so that they are not likely to be stepped on or pinched by items placed upon or against them.

Servicing • Refer all servicing to qualified service personnel. There are no user-serviceable parts inside. To prevent the risk of shock, do not attempt to service this equipment yourself because opening or removing covers may expose you to dangerous voltage or other hazards.

Slots and openings • If the equipment has slots or holes in the enclosure, these are provided to prevent overheating of sensitive components inside. These openings must never be blocked by other objects.

Lithium battery • There is a danger of explosion if battery is incorrectly replaced. Replace it only with the same or equivalent type recommended by the manufacturer. Dispose of used batteries according to the manufacturer's instructions.

Avertissement

Alimentations• Ne faire fonctionner ce matériel qu'avec la source d'alimentation indiquée sur l'appareil. Ce matériel doit être utilisé avec une alimentation principale comportant un fil de terre (neutre). Le troisième contact (de mise à la terre) constitue un dispositif de sécurité : n'essayez pas de la contourner ni de la désactiver.

Déconnexion de l'alimentation• Pour mettre le matériel hors tension sans danger, déconnectez tous les cordons d'alimentation de l'arrière de l'appareil ou du module d'alimentation de bureau (s'il est amovible) ou encore de la prise secteur.

Protection du cordon d'alimentation • Acheminer les cordons d'alimentation de manière à ce que personne ne risque de marcher dessus et à ce qu'ils ne soient pas écrasés ou pincés par des objets.

Réparation-maintenance • Faire exécuter toutes les interventions de réparation-maintenance par un technicien qualifié. Aucun des éléments internes ne peut être réparé par l'utilisateur. Afin d'éviter tout danger d'électrocution, l'utilisateur ne doit pas essayer de procéder lui-même à ces opérations car l'ouverture ou le retrait des couvercles risquent de l'exposer à de hautes tensions et autres dangers.

Fentes et orifices • Si le boîtier de l'appareil comporte des fentes ou des orifices, ceux-ci servent à empêcher les composants internes sensibles de surchauffer. Ces ouvertures ne doivent jamais être bloquées par des objets.

Lithium Batterie • Il a danger d'explosion s'll y a remplacment incorrect de la batterie. Remplacer uniquement avec une batterie du meme type ou d'un ype equivalent recommande par le constructeur. Mettre au reut les batteries usagees conformement aux instructions du fabricant.

Vorsicht

Stromquellen • Dieses Gerät sollte nur über die auf dem Produkt angegebene Stromquelle betrieben werden. Dieses Gerät wurde für eine Verwendung mit einer Hauptstromleitung mit einem geerdeten (neutralen) Leiter konzipiert. Der dritte Kontakt ist für einen Erdanschluß, und stellt eine Sicherheitsfunktion dar. Diese sollte nicht umgangen oder außer Betrieb gesetzt werden.

Stromunterbrechung • Um das Gerät auf sichere Weise vom Netz zu trennen, sollten Sie alle Netzkabel aus der Rückseite des Gerätes, aus der externen Stomversorgung (falls dies möglich ist) oder aus der Wandsteckdose ziehen.

Schutz des Netzkabels • Netzkabel sollten stets so verlegt werden, daß sie nicht im Weg liegen und niemand darauf treten kann oder Objekte darauf- oder unmittelbar dagegengestellt werden können.

Wartung • Alle Wartungsmaßnahmen sollten nur von qualifiziertem Servicepersonal durchgeführt werden. Die internen Komponenten des Gerätes sind wartungsfrei. Zur Vermeidung eines elektrischen Schocks versuchen Sie in keinem Fall, dieses Gerät selbst öffnen, da beim Entfernen der Abdeckungen die Gefahr eines elektrischen Schlags und/oder andere Gefahren bestehen.

Schlitze und Öffnungen • Wenn das Gerät Schlitze oder Löcher im Gehäuse aufweist, dienen diese zur Vermeidung einer Überhitzung der empfindlichen Teile im Inneren. Diese Öffnungen dürfen niemals von anderen Objekten blockiert werden.

Litium-Batterie • Explosionsgefahr, falls die Batterie nicht richtig ersetzt wird. Ersetzen Sie verbrauchte Batterien nur durch den gleichen oder einen vergleichbaren Batterietyp, der auch vom Hersteller empfohlen wird. Entsorgen Sie verbrauchte Batterien bitte gemäß den Herstelleranweisungen.

Advertencia

Alimentación eléctrica • Este equipo debe conectarse únicamente a la fuente/tipo de alimentación eléctrica indicada en el mismo. La alimentación eléctrica de este equipo debe provenir de un sistema de distribución general con conductor neutro a tierra. La tercera pata (puesta a tierra) es una medida de seguridad, no puentearia ni eliminaria.

Desconexión de alimentación eléctrica • Para desconectar con seguridad la acometida de alimentación eléctrica al equipo, desenchufar todos los cables de alimentación en el panel trasero del equipo, o desenchufar el módulo de alimentación (si fuera independiente), o desenchufar el cable del receptáculo de la pared.

Protección del cables de alimentación • Los cables de alimentación eléctrica se deben instalar en lugares donde no sean pisados ni apretados por objetos que se puedan apoyar sobre ellos.

Reparaciones/mantenimiento • Solicitar siempre los servicios técnicos de personal calificado. En el interior no hay partes a las que el usuario deba acceder. Para evitar riesgo de electrocución, no intentar personalmente la reparación/mantenimiento de este equipo, ya que al abrir o extraer las tapas puede quedar expuesto a voltajes peligrosos u otros riesgos.

Ranuras y aberturas • Si el equipo posee ranuras o orificios en su caja/alojamiento, es para evitar el sobrecalientamiento de componentes internos sensibles. Estas aberturas nunca se deben obstruir con otros objetos.

Batería de litio • Existe riesgo de explosión si esta batería se coloca en la posición incorrecta. Cambiar esta batería únicamente con el mismo tipo (o su equivalente) recomendado por el fabricante. Desachar las baterías usadas siguiendo las instrucciones del fabricante.

FCC Class A Notice

Note: This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference, in which case the user will be required to correct the interference at his own expense.

Note: This unit was tested with shielded cables on the peripheral devices. Shielded cables must be used with the unit to ensure compliance.

Extron's Warranty

Extron Electronics warrants this product against defects in materials and workmanship for a period of three years from the date of purchase. In the event of malfunction during the warranty period attributable directly to faulty workmanship and/or materials, Extron Electronics will, at its option, repair or replace said products or components, to whatever extent it shall deem necessary to restore said product to proper operating condition, provided that it is returned within the warranty period, with proof of purchase and description of malfunction to:

USA, Canada, South America, and Central America:

Extron Electronics
1001 East Ball Rd.
Anaheim, CA 92805, USA

Asia:

Extron Electronics, Asia
135 Joo Seng Road, #04-01
PM Industrial Bldg.
Singapore 368363

Europe, Africa, and the Middle East:

Extron Electronics, Europe
Beeldschermweg 6C
3821 AH Amersfoort
The Netherlands

Japan:
Extron Electronics, Japan
Kyodo Building
16 Ichibancho
Chiyoda-ku, Tokyo 102-0082
Japan

This Limited Warranty does not apply if the fault has been caused by misuse, improper handling care, electrical or mechanical abuse, abnormal operating conditions or non-Extron authorized modification to the product.

If it has been determined that the product is defective, please call Extron and ask for an Applications Engineer at (714) 491-1500 (USA), 31.33.453.4040 (Europe), 65.6383.4400 (Asia), or 81.3.3511.7655 (Japan) to receive an RA# (Return Authorization number). This will begin the repair process as quickly as possible.

Units must be returned insured, with shipping charges prepaid. If not insured, you assume the risk of loss or damage during shipment. Returned units must include the serial number and a description of the problem, as well as the name of the person to contact in case there are any questions.

Extron Electronics makes no further warranties either expressed or implied with respect to the product and its quality, performance, merchantability, or fitness for any particular use. In no event will Extron Electronics be liable for direct, indirect, or consequential damages resulting from any defect in this product even if Extron Electronics has been advised of such damage.

Please note that laws vary from state to state and country to country, and that some provisions of this warranty may not apply to you.

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安全须知 • 中文

这个符号提示用户该设备用户手册中的操作和维护说明。

这个符号警告用户该设备机壳内暴露的危险电压，有触电危险。

注意

阅读说明书 • 用户使用该设备前必须阅读并理解有安全和使用说明。

保存说明书 • 用户应保存安全说明书以备将来使用。

遵守警告 • 用户应遵守产品和用户指南上的所有安全和操作说明。

避免追加 • 不要使用该产品厂商没有推荐的工具或追加设备，以避免危险。

警告

电源 • 该设备只能使用产品上标明的电源。 设备必用有地线供电系统供电。第三条线（地线）是安设施，不能不用或跳过。

拔掉电源 • 为安全地从设备拔掉电源，请拔掉所有备后或桌面电源的电源线，或任何接到市电系统电源线。

电源线保护 • 妥善布线， 避免被踩踏，或重物挤压。

维护 • 所有维修必须由认证的维修人员进行。 设备部没有用户可以更换的零件。为避免出现触电危不要自己试图打开设备盖子维修该设备。

通风孔 • 有些设备机壳上有通风槽或孔，它们是用防止机内敏感元件过热。不要用任何东西挡住通风孔。

锂电池 • 不正确的更换电池会有爆炸的危险。必须使与厂家推荐的相同或相近型号的电池。按照生产厂的议处理废弃电池。

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Quick Start Guide — IPL T S Series

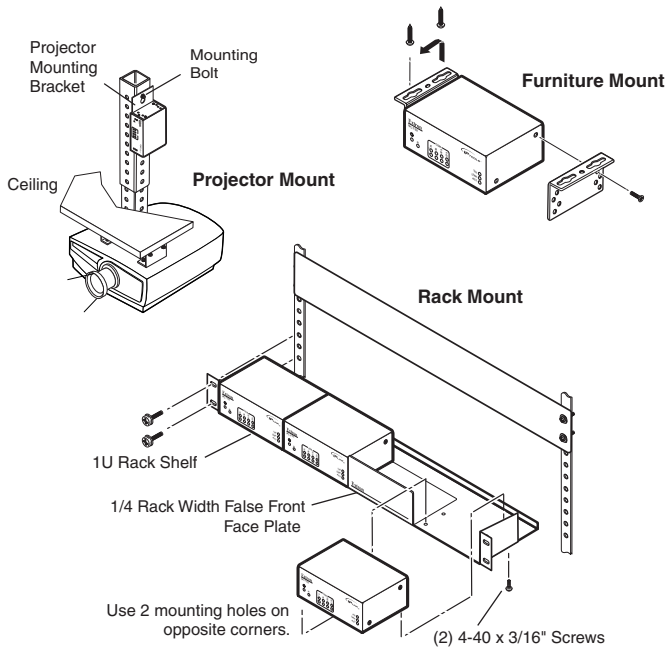
To install and set up an IPL T S series interface, follow these steps:

Step 1

Turn all of the equipment off and disconnect it from the power source.

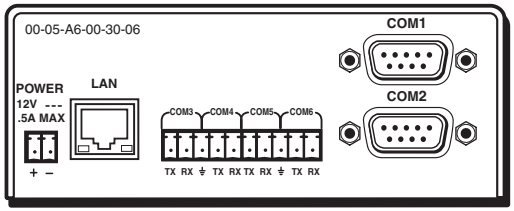
Step 2

Mount the IPL T S unit on a projector, under a desktop, or on a rack shelf, as illustrated below.



Step 3

Attach the network (LAN) cable to the IPL T S unit and to a host PC, switch, hub, or router. See "Ethernet connection" in chapter 3 for more information about this connection.



Extron IPL T S6 Ethernet Control Interface

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Quick Start Guide — IPL T S Series, cont'd

Step 4

Attach the serial communication cables from the IPL T S unit to the devices being controlled.

Step 5

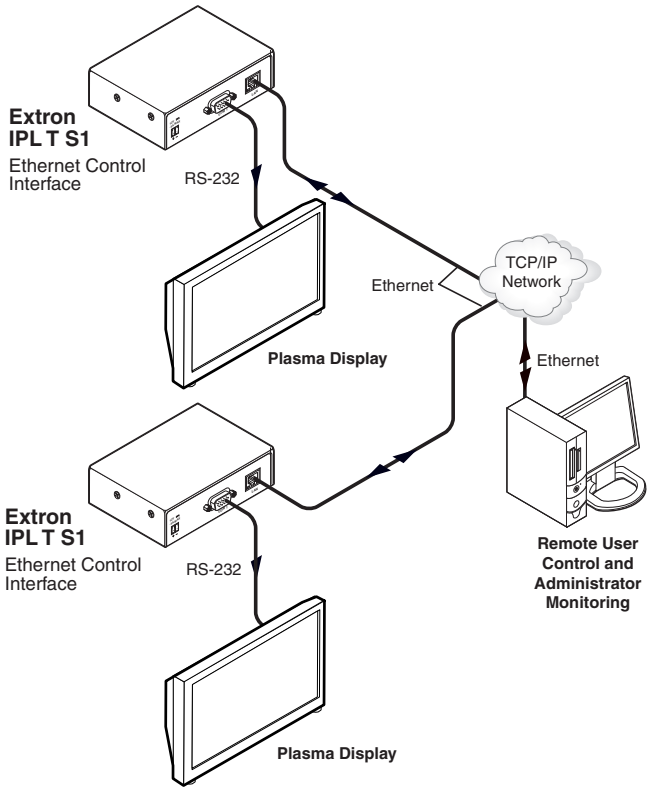
Connect power cords and turn on the equipment in the following order: output devices (projectors, monitors, and speakers), the IPL T S interface, a serial controller or computer (PC), and then the input devices (DSS, cable boxes, etc.).

Step 6

Configure the IPL T S interface using the ARP command. See "IPL T S interface configuration" in chapter 3 for more information.

Step 7

Communicate with the IPL T S interface via the default Web pages. See "Communication with the IPL T S Interface" in chapter 4 for more information.



Typical connection set up

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Chapter One

Introduction

About this Manual

About the IPL T S Series Interfaces

Features

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About this Manual

This manual contains information about the Extron IPL T S series of Ethernet control interfaces, including how to install, configure, and operate them. Information in this manual applies to the IPL T S1 (Extron part #**60-801-01**), IPL T S2 (#**60-544-81**), IPL T S4 (#**60-544-83**), and IPL T S6 (#**60-544-84**) models, except where noted.

About the IPL T S Series Interfaces

The Extron IPL T S series interfaces are Ethernet-based control interfaces designed to be used as one of many nodes in a distributed control system environment. They can also be used as stand-alone control interfaces allowing legacy products to link to today's IP-based networks.

The IPL T S series interfaces ship with an external, desktop, 12 VDC, 1 A power supply (#**70-055-01**) that accepts 100-240 VAC input.

Serial port connectors

The IPL T S boxes have two serial port connector types: 9-pin D connector or captive screw.

- The 9-pin D connectors on the IPL S2, S4, and S6 models support RS-232, RS-422, and RS-485. Their captive screw connectors support RS-232 only.
- The IPL T S1 uses solely 9-pin D connectors and only supports the RS-232 protocol.
- The IPL T S1 has one serial port on a 9-pin D connector, the IPL T S2 has two serial ports available on both 9-pin D and captive screw connectors. The IPL T S4 has four serial ports on 9-pin D connectors. The IPL T S6 has six ports: two on 9-pin D and four on captive screw connectors.

All serial ports are fully software configurable through the network using either the default Web pages, Extron DataViewer, or a Telnet connection.

NOTE *The* 3-pole captive screw *serial ports on the* ***IPL T S2 and S6*** *support only RS-232.*

NOTE *The* 9-pin D connectors *on the* ***IPL T S1*** *support only RS-232.*

Web server pages

The IPL T S series interfaces host their own Web pages stored in flash memory within the device, and, except for the IPL T S1 model, can accept power over a LAN (local area network). The interfaces support Telnet, SMTP (simple mail transfer protocol), ICMP (Internet control message protocol) or ping, and DHCP (dynamic host configuration protocol).

Mounting options

The IPL T S1 is approximately 1 inch high and one quarter rack wide, while all other models (S2, S4, and S6) are 1U high and one quarter rack wide. They are rack mountable, using either a VersaTools™ Rack Shelf Kit (**#60-190-20**) or a Universal 1U Rack Shelf (**#60-190-01**). They can also be mounted under a desk or podium top, or on a projector mount.

Features

Support for bidirectional RS-232, RS-422, and RS-485 serial communication — Allows remote and proactive monitoring and troubleshooting of serially controlled devices.

NOTE *The IPL T S1 supports RS-232 only.*

Serial port pass-through — Two-, four-, and six-port models can be configured for pass-through mode, enabling each pair of ports on the interfaces to pass through commands and control a single device.

Web-based A/V asset management — When used with GlobalViewer software, the IPL T S interfaces provide a powerful, flexible way to manage, monitor, and control projectors, flat-panel displays, and other devices using a standard Ethernet network.

Integral, high performance Web server — Each IPL T S interface features a built-in Web server with memory available for storing device drivers, GlobalViewer, and development of your own Web pages using "off-the-shelf" Web authoring software.

Industry standard Ethernet protocols — All IPL T S models support industry standard Ethernet communication protocols, including ARP, DHCP, ICMP, UDP/IP, TCP/IP, Telnet, HTTP, and SMTP, accessed through a RJ-45 auto-sense 10/100 Mbps Ethernet LAN connection.

Simultaneous multi-user support — Each IPL T S interface supports multiple concurrent users, improving system throughput.

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E-mail capabilities to enable support — With e-mail notification, technical support administrators can receive failure and service messages through an e-mail enabled cell phone, PDA, pager, or Internet e-mail account.

Multiple levels of access with password protection — User access level authorizes limited entry to only pre-designated functions, while administrator access level permits full access to advanced settings.

Configuration utility — Global Configurator software, a free, easy to use Windows®-based configuration utility, makes product setup simple and intuitive—no programming knowledge is required.

Extensive library of device drivers — Device drivers allow Extron products to control various display and source devices, such as projectors, flat-panel displays, and DVD players. Extron has produced thousands of fully tested and uniformly modeled RS-232 and IR device drivers.

Power over Ethernet (PoE) — Most IPL T S models accept power over the LAN (802.3af compliant), but they can also use a 12 VDC power supply (provided), if required.

NOTE *The IPL T S1 does not support PoE.*

Direct port access — Use existing software programs to control a device that has no Ethernet support. Any existing Extron product with a serial control port can be interfaced with a LAN.

Built-in multi-level security — A user can control access to devices attached to the interface. Two levels of password protection provide appropriate security.

Serial port connectivity — Provides serial ports on 9-pin D and/or 3.5 mm, captive screw connectors.

Easy configuration and control — Easily control the interface in three ways:

- The Internet Explorer V5.5 browser
- A Web-based interface
- DataViewer (or a standard Telnet client application)

The IPL T S series requires no centralized processor to operate within a system.

Multiple mounting options — Can be mounted under a desktop or podium, on a projector mount, or on a rack shelf.

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Chapter Two

Installation and Operation

Installation Overview

Mounting the IPL T S Interface

Rear Panel Features and Cabling

Operation

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Installation Overview

To install and set up an IPL T S interface, follow these steps:

1. Turn all of the equipment off. Make sure that the video sources (DSS, cable boxes, or other devices), the IPL T S unit, the output devices (monitors, VCRs, projectors, etc.) and the serial controller are all turned off and disconnected from the power source.
2. Mount the IPL T S interface. See *Mounting the IPL T S Interface,* below.
3. Attach the cables. See *Connecting the Hardware* in chapter 3.
4. Connect power cords and turn on the devices in the following order: output devices (projectors, monitors, speakers), IPL T S interface, serial controller or computer (PC), then input devices (DSS, cable boxes, etc.).
5. Configure the IPL T S interface through DataViewer or Telnet, then access the unit using an Internet browser.

Mounting the IPL T S Interface

Rack mounting

For optional rack mounting, mount the interface on a VersaTools™ 19" 1U Rack Shelf (Extron part #**60-190-20**) (figure 2-1) or a standard Universal 1U Rack Shelf (#**60-190-01**) (figure 2-2). On the standard rack shelf, the interface mounts in one of four locations to the rear of the rack or in one of four locations to the front of the rack.

1. If feet were previously installed on the bottom of the IPL T S unit, remove them.
2. Mount the interface on the rack shelf, using two 4-40 x 3/16" screws in opposite (diagonal) corners to secure the interface to the shelf.
3. Install blank panel(s) or other unit(s) to the rack shelf.
4. Insert the shelf into the rack, aligning the holes in the shelf with those in the rack.
5. Secure the shelf to the rack using the supplied machine screws. This shelf can be mounted in the front or in the rear of the rack.

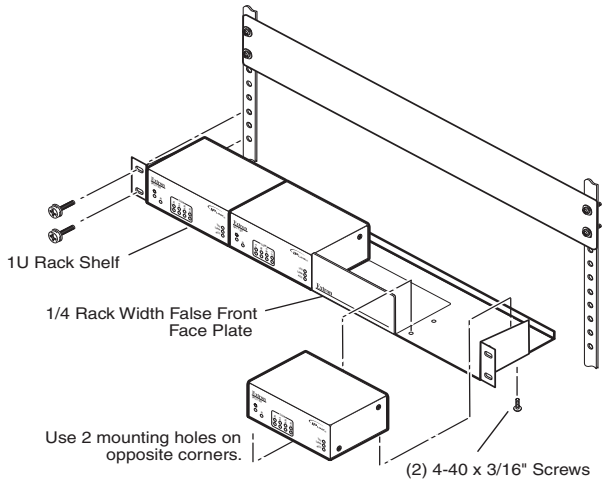

Figure 2-1 — Rack mounting the interface on the VersaTools shelf

NOTE *Only products in the IPLink™ or VersaTools lines can be mounted to a VersaTools shelf. Any 1U or 1 inch high rack-mountable Extron product can be mounted on the standard shelf (**#60-190-01**).*

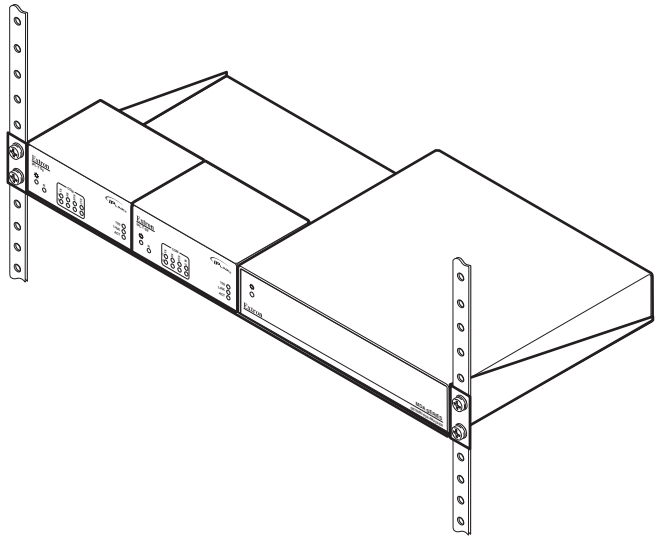

Figure 2-2 — Mounting the interface on the standard shelf

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Furniture or projector mounting

In addition to using the IPL T S unit on a rack, you can mount it on furniture or a projector using optional mounting kits (for the IPL T S2, S4, and S6: **#70-212-01** for furniture, or **#70-217-04** for a projector; and for the IPL T S1: **#70-077-01** for furniture, or **#70-077-04** for a projector) as follows:

1. Attach the mounting brackets to the interface with the provided machine screws (figure 2-3).
2. If feet were previously installed on the bottom of the interface, remove them.
3. **For furniture mounting,** hold the interface with the attached brackets against the underside of the table or other furniture. Mark the location of the screw holes of the bracket on the mounting surface.
4. **For furniture mounting,** drill 3/32" (2 mm) diameter pilot holes, 1/4" (6.3 mm) deep in the mounting surface at the marked screw locations.
5. **For furniture mounting,** insert #8 wood screws into the four pilot holes. Tighten each screw into the mounting surface until just less than 1/4" of the screw head protrudes.
6. **For furniture mounting,** align the mounting screws with the slots in the brackets and place the interface against the surface, with the screws through the bracket slots.
7. **For furniture mounting,** slide the unit slightly forward or back, then tighten all four screws to secure it in place.
8. **For projector mounting,** secure the interface to a projector mount or other surface by inserting the mounting bolt through the bracket's slotted hole.

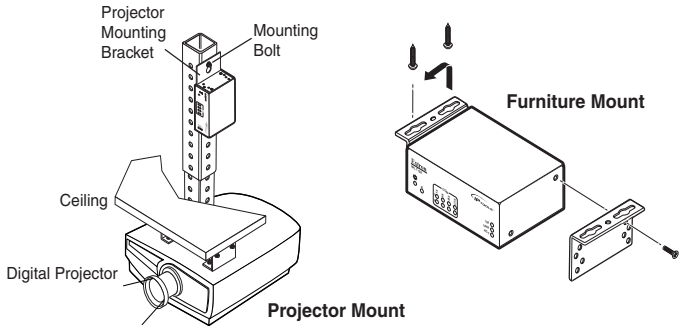

Figure 2-3 — Mounting the interface

Rear Panel Features and Cabling

All connections, including power, control, input, and output, are on the back panel of the IPL T S interface. See figures 2-4, 2-5, 2-6, and 2-7 for details on each model.

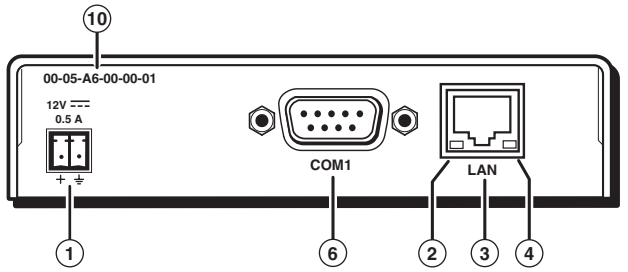

Figure 2-4 — IPL T S1 interface back panel

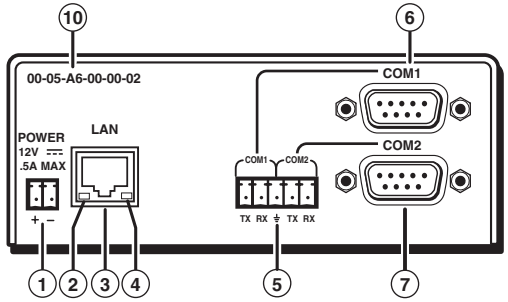

Figure 2-5 — IPL T S2 interface back panel

NOTE *The IPL T S 2 allows for use of* ***either*** *the 9-pin D connector* ***or*** *the captive screw connector on COM1 or COM2. The 9-pin D connector COM ports and the captive screw connector COM ports* should not *be connected simultaneously.*

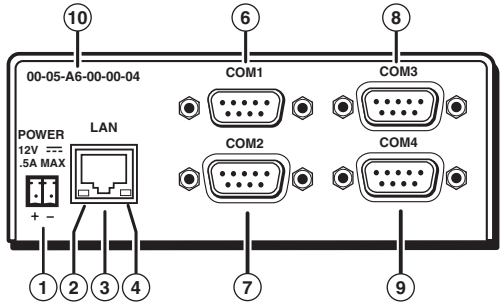

Figure 2-6 — IPL T S4 interface back panel

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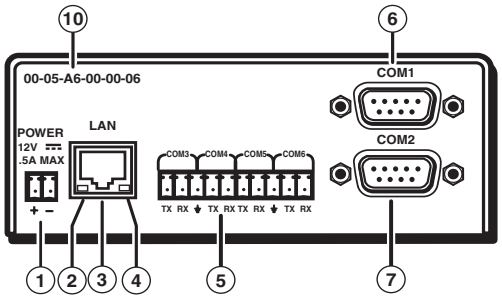


Figure 2-7 — IPL T S6 interface back panel

Power

(1) **Power connection —** Plug the external 12 V power supply into this connector. The power supply is included with the unit.

NOTE *When using Power over Ethernet (PoE) and the 12 V power supply simultaneously, the unit takes power from its 12 V connector.*

CAUTION *When you are connecting the power supply, voltage polarity is extremely important. Applying power with incorrect voltage polarity could damage the power supply and the interface. Identify the power cord negative lead by the ridges on the side of the cord.*

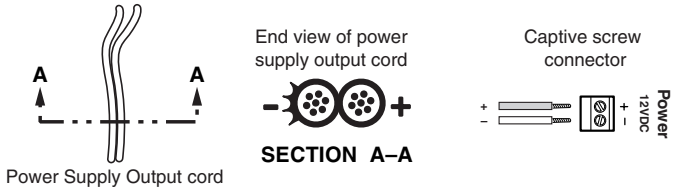


Figure 2-8 — Power connector wiring

NOTE *Do not tin the stripped power supply leads before installing the captive screw connector. Tinned wires are not as secure in the captive screw connectors and could pull out.*

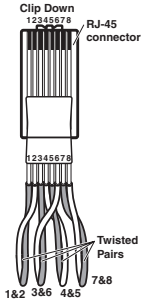
WARNING *The two power cord wires must be kept separate while the power supply is plugged in. Remove power before continuing.*

To verify the polarity before connection, plug in the power supply with no load and check the output with a voltmeter.

Ethernet/LAN

(2) **LAN Activity LED —** The yellow LED blinks to indicate LAN activity.

(3) **LAN connector —** Plug an RJ-45 jack into this socket to connect the unit to a computer network. Use a straight- through cable to connect to a switch, hub, or router, or a crossover cable to connect directly to a PC.



Straight-through cable

Side 1		Side 2	
Pin	Wire color	Pin	Wire color
1	White-orange	1	White-orange
2	Orange	2	Orange
3	White-green	3	White-green
4	Blue	4	Blue
5	White-blue	5	White-blue
6	Green	6	Green
7	White-brown	7	White-brown
8	Brown	8	Brown

Crossover cable

Side 1		Side 2	
Pin	Wire color	Pin	Wire color
1	White-orange	1	White-green
2	Orange	2	Green
3	White-green	3	White-orange
4	Blue	4	Blue
5	White-blue	5	White-blue
6	Green	6	Orange
7	White-brown	7	White-brown
8	Brown	8	Brown

Figure 2-9 — RJ-45 connector wiring

(4) **Link LED —** The green LED lights to indicate a good LAN connection.

Serial communication

(5) **Captive screw connector —** Plug a 3.5 mm, 5-pole captive screw connector into this socket for serial ports 1 and 2 (IPL T S2) or serial ports 3 through 6 (IPL T S6) connections. Pacing and handshaking are not supported.

(6) **COM1 —** Plug a serial cable into this 9-pin D connector for serial port 1 connection.

(7) **COM2 —** Plug a serial cable into this 9-pin D connector for serial port 2 connection.

(8) **COM3 —** Plug a serial cable into this 9-pin D connector for serial port 3 connection (S4 only).

(9) **COM4 —** Plug a serial cable into this 9-pin D connector for serial port 4 connection (S4 only).

The IPL T S interface can be used to control display devices, switchers, and other A/V equipment via an RS-232/RS-422/ RS-485 connection. Factory default protocol for the control interface is RS-232, 9600 baud, no parity, 8 data bits, 1 stop bit,

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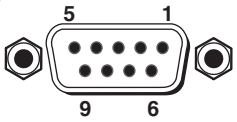
pacing = 0 ms, and handshaking = off. The control device (PC, laptop, etc.) can use either Extron's Simple Instruction Set™ (SIS) or the default Web pages (or Web server), via a Web browser.

The rear panel 9-pin D connector COM ports have the following pin assignments:

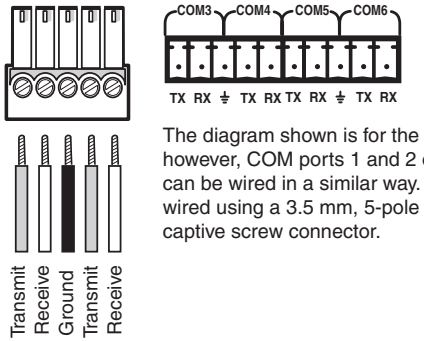
Pin	Function	RS-232	RS-422	RS-485
2	Receive Data/Receive Data -	RX	RX-	Data - Tie 2 & 3
3	Transmit Data/Transmit Data -	TX	TX-	
5	Signal Ground	GND	GND	GND
7	Request to Send/Transmit Data +	RTS	TX+	Data + Tie 7 & 8
8	Clear to Send/Receive Data +	CTS	RX+	

Figure 2-10 — 9-pin D connector pin assignments (IPL T S1 uses RS-232 only)

NOTE *When using RS-485 with the connections indicated above, Data + can connect to either pin 7 or pin 8, and Data - can connect to either pin 2 or pin 3.*



9-Pin D Connector Pin Locations, Female



The diagram shown is for the IPL T S6; however, COM ports 1 and 2 of the IPL T S2 can be wired in a similar way. Both can be wired using a 3.5 mm, 5-pole or 3-pole captive screw connector.

Figure 2-11 — 5-pin captive screw assignments

NOTE *The IPL T 2 allows for use of either the 9-pin D connector or the captive screw connector on COM1 or COM2. The 9-pin D connector COM ports and the captive screw connector COM ports cannot be connected simultaneously.*

Identification

(10) **UID # —** The unique user ID number (MAC address) of the unit (for example, 00-05-A6-00-00-01).

Operation

Connect power cords and turn on the output display devices (projectors, monitors, VCRs), control devices (switchers, scalers, distribution amplifiers), interface, and input devices (PC, laptop, network equipment).

Check indicator LEDs on the PC/laptop, on the interface, and on the network hub/router, etc., to ensure that all devices are plugged in and communicating. The IPL T S interface is now ready to be configured (see chapter 3, *Connection and Configuration*).

If connection or communication problems occur, see *Troubleshooting* in chapter 4. If the troubleshooting tips do not help, check with your local network administrator, or call the Extron S³ Sales & Technical Support Hotline.

Front panel indicators

The front panels of the IPL T S interfaces have several indicator LEDs that show the current status of communications to and from the unit. A reset button ((2)) is also available from the front panel, in a small recess next to the Power LED.

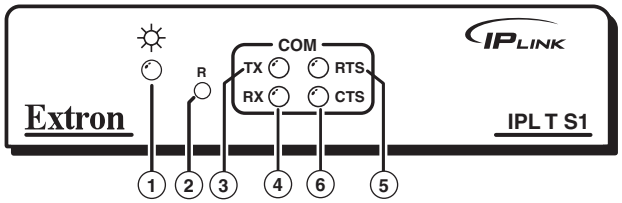


Figure 2-12 — IPL T S1 front panel

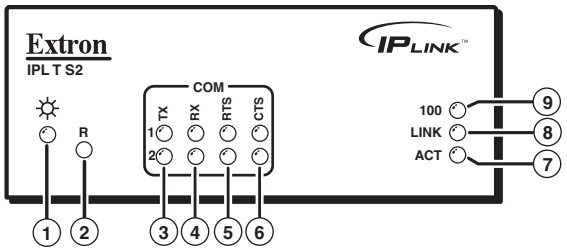


Figure 2-13 — IPL T S2 front panel

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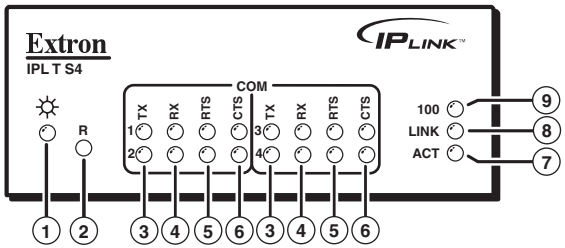

Figure 2-14 — IPL T S4 front panel

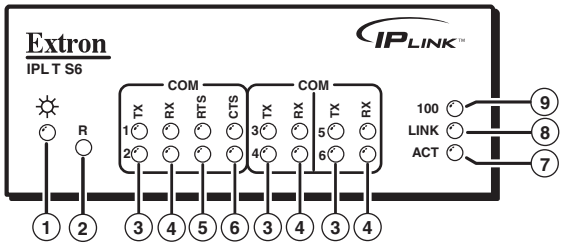

Figure 2-15 — IPL T S6 front panel

(1) **Power LED —** A green LED lights to indicate that the interface is receiving power.

(2) **Reset button (recessed) —** See "Resetting the unit" on the following page for additional details on this multiple function reset button.

(3) **TX LEDs —** A green LED indicates that data is being transmitted from the corresponding serial port (1-6).

(5) **RX LEDs —** A green LED indicates data is being received by the corresponding serial port (1-6).

(5) **RTS LEDs —** A green LED indicates that the corresponding serial port (1-4) is ready to send data.

(6) **CTS LEDs —** A green LED indicates that the device controlled by the corresponding serial port (1-4) is ready to accept data.

(7) **Act (Activity) LED —** A yellow LED indicates that data is being sent/received.

(8) **Link LED —** A green LED indicates that the unit is connected to an active network.

(9) **100 LED —** A green LED indicates that the connection speed is 100 Mbps. If the LED is not lit, the connection speed is 10 Mbps.

Resetting the unit

There are five reset modes available by using the Reset button ((2)) on the front panel. The Reset button is recessed, so use a pointed stylus, ballpoint pen, or Extron Tweeker.

CAUTION *Review the reset modes carefully. Use of the wrong reset mode may result in unintended loss of flash memory programming, reassignment of ports, or a unit reboot.*

CAUTION *The listed reset modes (with the exception of Mode 2) close all open IP and Telnet connections and all sockets.*

NOTE *If the reset button is continuously held down, every three seconds the LED pulses (blinks) and puts the unit in a different mode, corresponding to the underscored notes in Modes 3 through 5. The Mode 5 LED blinks three times, the third blink indicating that it is the last mode. The following modes are listed as separate functions, not as a continuation from Mode 1 to Mode 5.*

Mode 1 — Holding the reset button while applying power resets the unit back to the base firmware that was shipped with the unit from the factory. Event scripting does not start when the unit is powered on in this mode. This allows you to recover a unit that has incorrect code or updated firmware running. All user files and settings are maintained. User Web pages may not work correctly if you are using an earlier firmware version.

Mode 2 — Momentarily (<1 second) press the reset button and, from your keyboard, type three "+'s" (i.e., "+++") within 2 seconds of the momentary press. This enables the connected COM port to be used as a console port to send SIS commands. If the three "+s" are not entered in the 2 second time frame, the COM port becomes a control port only.

Mode 3 — Holding the reset button until the Power LED blinks once (3 seconds) followed by a momentary (<1 second) press turns events either On or Off, depending on the current state of the events:

1. If the events are currently stopped following the momentary (<1 second) press, the Power LED *flashes twice* indicating the starting of events.
2. If events are currently running following the momentary (<1 second) press, the Power LED *flashes three times* indicating the stopping of events.

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Each flash lasts for 0.25 seconds. Nothing happens if the momentary press does not occur within 1 second.

Mode 4 — Holding the reset button until the Power LED blinks twice (6 seconds) followed by a momentary (<1 second) press resets IP settings. The Power LED will blink four times in quick succession, confirming a Mode 4 reset. This mode

- Enables ARP program capability.
- Sets the IP address back to its factory IP address.
- Sets the subnet mask back to its factory default.
- Sets gateway IP address back to its factory default.
- Sets Port mapping back to its factory default.
- Turns the DHCP off.
- Turns events off.

Nothing happens if the momentary press does not occur within 1 second.

Mode 5 — Holding the reset button until the Power LED blinks three times (9 seconds) followed by a momentary (<1 second) press causes an absolute system reset back to factory default conditions. Nothing happens if the momentary press does not occur within 1 second. The power LED *blinks four times in quick succession*, confirming a Mode 5 reset.

3

Chapter Three

Connection and Configuration

Connecting the Hardware

Configuring the Hardware

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Connecting the Hardware

To connect the IPL T S interface, connect the input and output devices to the unit. Use figure 3-1 below as a guide.

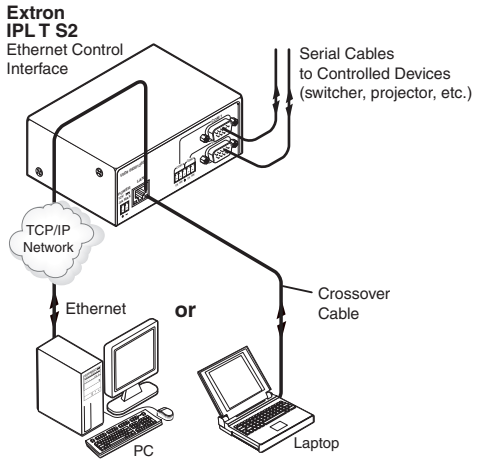

Figure 3-1 — IPL T S interface connections

Ethernet connection

Ethernet connection is used on an ongoing basis to connect the IPL T S unit to a LAN and to control the switching and display devices attached to the unit. To connect the unit to a LAN, do the following:

1. Plug one end of a Cat 5, straight-through Ethernet cable into the rear panel Ethernet connector on the IPL T S unit. Refer to figure 2-9 in chapter 2 for RJ-45 connector wiring information.
2. Plug the other end of the Ethernet cable into a network switch or hub connected to an Ethernet LAN or to the Internet.
3. From your PC, launch a Web browser and type in the IP address previously set up on the IPL T S (if this hasn't been set up, refer to "IPL T S interface configuration" later in this chapter). The System Status Web page displays.

Serial connection

The IPL T S interface can be connected to any A/V device that has a serial control port.

1. Connect one end of a serial cable to the rear panel COM port connector of the IPL T S unit. As an alternative, use a 3.5 mm, 5-pole captive screw connector where available.

NOTE *This captive screw connector must be wired appropriately. See figure 2-11 for pin assignments, if necessary.*

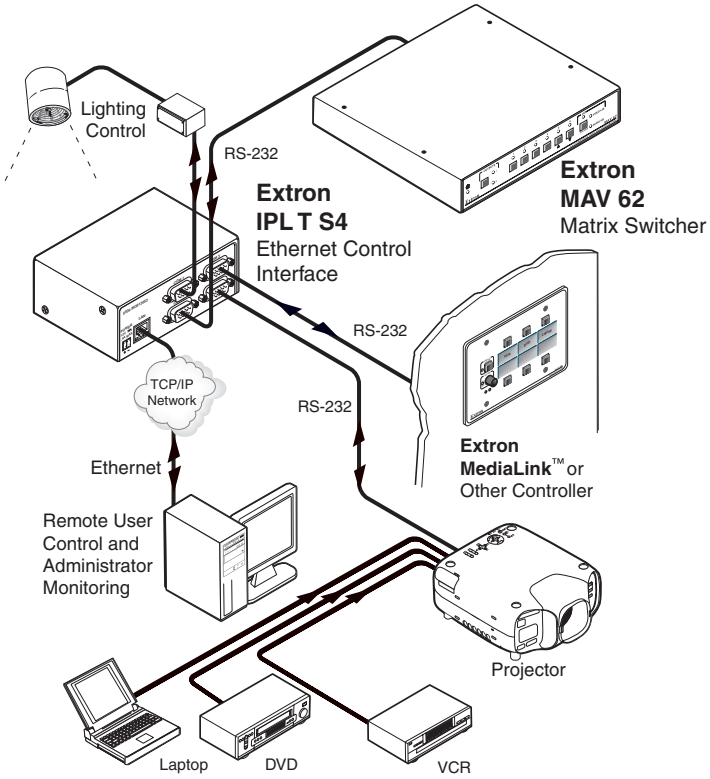

Figure 3-2 — Typical IPL T S interface operating configuration

2. Connect the other end of the serial cable to the display or switching device to be controlled through the IPL T S.

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Configuring the Hardware

To function together properly, both the controlling PC and the IPL T S interface must be configured correctly: the PC must be network-capable, with the proper protocols installed, and the hardware configured correctly. The interface must also be set to recognize and accept commands and pass them through to the switcher, projector, or other controlled device.

PC configuration

This manual assumes that you have a PC equipped with an operating network interface card (NIC) and running the Windows operating system. To allow your PC to communicate with Extron's Ethernet-controlled products, the TCP/IP protocol must be installed and properly configured.

When on an existing Ethernet LAN intranet, your network administrator can provide you with a unique IP address or DHCP (Dynamic Host Configuration Protocol) Web address with which to sign on.

Initial start up

When you power on the IPL T S unit for the first time, there are two ways to set up its IP address:

1. The ARP command method
2. The direct PC method

Once the IPL T S interface has an active network connection with IP access, its preloaded default Web pages provide a way to reconfigure it. These Web pages are compatible with Netscape Navigator (version 6.0 or higher), or Internet Explorer (version 5.5 or higher). See *Communication with the IPL T S Interface* in chapter 4 for detailed information on these Web pages.

Once the IPL T S has been reconfigured, an Ethernet (intranet or Internet) connection can then be used to contact or control it. See "Ethernet connection" earlier in this chapter for additional information on Ethernet hardware.

IPL T S interface configuration

Configuring the IPL T S using the ARP command

You can make use of the ARP (Address Resolution Protocol) command to set up an IP address for your IPL T S interface. The ARP command tells your computer to associate the IPL T S unit's MAC address with the assigned IP address. You must then use ping to access the IPL T S unit, at which point the device server's IP address is reconfigured.

NOTE *In order to use this setup method, both your computer and IPL T S interface must be connected to the same subnet.*

Use ARP to configure the IP address as follows:

1. Obtain a valid IP address for your IPL T S interface from your network administrator.
2. Obtain the IPL T S unit's MAC address (UID #) from the label on its back panel.
3. If the unit has never been configured and is still set for factory defaults, go to step 4. If not, perform a Mode 4 system reset.

CAUTION *Review all aspects of the Mode 4 reset before performing this option. For detailed information on reset modes, see* Resetting the unit *in chapter 2.*

CAUTION *Your IPL T S unit must be configured with the factory default IP address — 192.168.254.254 — before executing the ARP command, as described below.*

4. Access the MS-DOS command prompt, then execute the arp –s command.

   Enter the desired new IP address, followed by a space, and the MAC address (the MAC address is located on the rear panel's upper right corner) for the IPL T S unit. For example:

   arp –s 10.13.170.15 00-05-A6-00-0A-90

Figure 3-3 — Executing the ARP command

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5. Execute a ping command by typing your new IP address at the command prompt. For example:

   ping 10.13.170.15

   After you enter this command, the unit changes to the new address and starts responding to the ping requests, as shown below. The IPL T S unit's IP address should now be updated to the new address; you can reconnect using DataViewer, Telnet or its IP/Web address to verify that the update was successful.

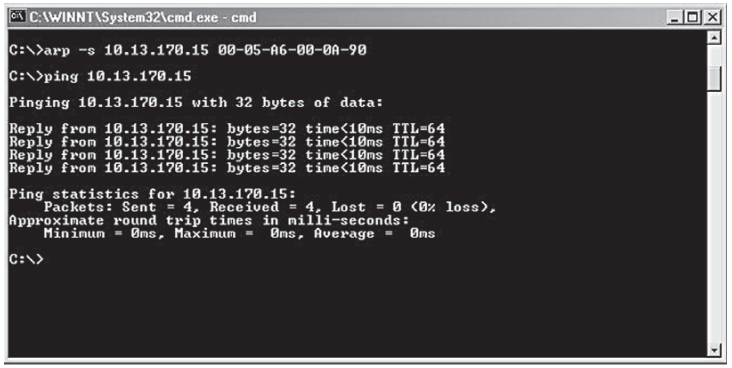

Figure 3-4 — Unit response to a ping request

6. After verifying that the change was successful, issue the arp –d command at the DOS prompt. For example, the command

   arp –d 10.13.170.15 removes 10.13.170.15 from the arp table

   or

   arp –d removes all static IP addresses from the arp table.

Configuring the IPL T S using direct PC connection

This type of connection is used to initially connect to and configure the IPL T S unit. You must change the unit's default settings (IP address, subnet mask, and [optional] administrator password) in order to use the IPL T S unit on an intranet (LAN) or on the Internet (WAN).

1. Plug one end of a Cat 5, crossover Ethernet cable into the LAN connector of the IPL T S unit. See figure 2-9 in chapter 2 for RJ-45 connector wiring information.
2. Plug the other end of the Ethernet cable into the Ethernet port on your PC.
3. Right-click on the Network Neighborhood or My Network Places icon on your Windows (98, 2000, NT, ME, or XP) desktop, and select Properties from the menu.
4. Right-click on Local Area Connection, and select Properties from the menu.
5. Select Internet Protocol (TCP/IP) from the list, and click on Properties again.

   NOTE *If Internet Protocol (TCP/IP) is not on the list, it must be added (installed). Refer to your Windows user's manual or the online help system for information on how to install the TCP/IP protocol.*

6. Write down your current IP address and subnet mask below. If your PC is set to "Obtain an IP address automatically," make a note of that, instead.

   IP Address:

   . . .

   Subnet Mask:

   . . .

7. Click on "Specify an IP address" or "Use the following IP address" (depending on your operating system), and leave the default gateway blank. Enter the following values:

   IP address: **192.168.254.253**

   Subnet mask: **255.255.0.0**

8. Save the changes and exit the Network setup. Reboot the PC, if required for the changes to become effective.
9. Launch your Web browser (e.g., Internet Explorer), and type "http://192.168.254.254/" in the address box. The unit's System Status page displays. See "Accessing and using the Web server", in chapter 4, for information on configuring your unit using these default Web pages.
10. After configuring your IPL T S unit, repeat steps 3 and 5; and change your TCP/IP settings back to their original configuration using the notes taken in step 6.

Firmware upgrades

Firmware upgrades are available periodically as improvements are made to the versatility and functionality of the IPL T S interface series. These upgrades are available for download from the Extron Web site. For information on upgrading the firmware, see "Upgrading the firmware" in chapter 4.

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Chapter Four

Communication and Control

Ports Overview

Communication with the IPL T S Interface

Programmer's Guide for Telnet and Web Browsers

Customization

Advanced Serial Port Control

Troubleshooting

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Ports Overview

The IPL T S products have several models incorporating bidirectional serial control ports. These serial ports allow for control of a wide variety of existing Extron and third-party devices. The most common serial control formats are RS-232, RS-422, and RS-485.

The two implementations of serial control on the IPL T S interfaces are 9-pin D and captive screw connectors.

9-pin D connector — On some IPL T S units, serial control is accessed through a 9-pin D connector. The 9-pin D connectors on the IPL S2, S4, and S6 boxes support RS-232, RS-422, and RS-485. The 9-pin D connector on the IPL T S1 supports *only* the RS-232 protocol.

With the RS-232 format, hardware handshaking (RTS, CTS) is also available. The RS-232 connection uses the same industry standard interface pinout as found on standard PCs. If selecting either RS-422 or RS-485 formats, verify proper wiring as detailed in figure 2-11 in chapter 2. These two formats do not have an industry standard pinout and vary from device to device.

NOTE *The 9-pin D connector on the IPL T S1 supports* only *RS-232.*

Captive screw connectors — On some IPL T S units, several of the serial interface ports are connected using captive screw terminals. When you are using the ports through captive screw terminals, only RS-232 control is available, and hardware handshaking is unavailable. Since RS-232 is the most common control interface encountered, this port configuration allows for quick termination.

NOTE *Pacing and handshaking are not supported on captive screw connectors.*

All of the bidirectional serial ports are completely software configurable. Baud rates can be set up to 115 Kbps. Using the Simple Instruction Set (SIS) commands found in the *Command/ response table for Simple Instruction Set (SIS) commands* later in this chapter, these ports can be configured to control most serial devices. Once a port is configured and properly cabled to the controlled device, serial commands can be issued to the port from a Web page, Extron DataViewer software, Telnet connection, or by using the advanced scripting capability built into the IP Link product family.

Communication with the IPL T S Interface

There are several methods available for "speaking" with your IPL T S from a PC. The following methods, Extron DataViewer, the default Web pages (or Web Server), and Extron's SIS commands, are explained in detail throughout the rest of this chapter.

Extron DataViewer

With the DataViewer program you can send ASCII or hexadecimal commands to an IPL T S and easily view its responses in DataViewer's Command/Response window.

DataViewer can be downloaded at no charge from the Extron Web site. To obtain DataViewer, do the following:

1. Go to **www.extron.com** and enter DataViewer in the Search field.
2. From the DataViewer page, click the Download Now button, and follow the instructions to load and use the software.

NOTE *For more detailed information about DataViewer operation, see the* DataViewer Help file *after loading the software.*

Communication with the interface using Telnet via DataViewer

To use a PC running DataViewer to connect with an IPL T S unit, do the following:

1. Open DataViewer. The Communication Setup dialog box appears.

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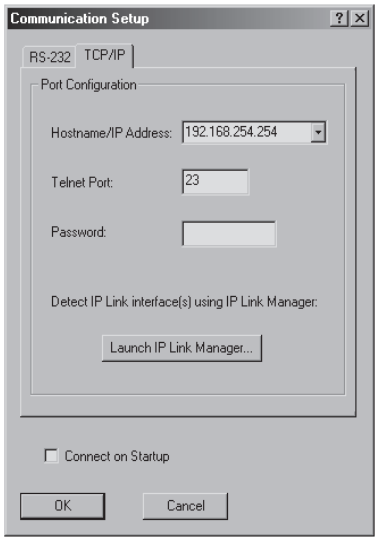

Figure 4-1 — DataViewer Communication Setup dialog box

2. Select the TCP/IP tab at the top of the Connection Setup dialog box.
3. In the Hostname/IP Address field, type the IP address for the IPL T S.
4. In the Telnet Port field, enter 23 to establish a Telnet connection.
5. If desired, select Connect on Startup.
6. Click OK. The DataViewer main window appears and displays part number, firmware version and other information about the connected IPL T S box, as shown on the following page.

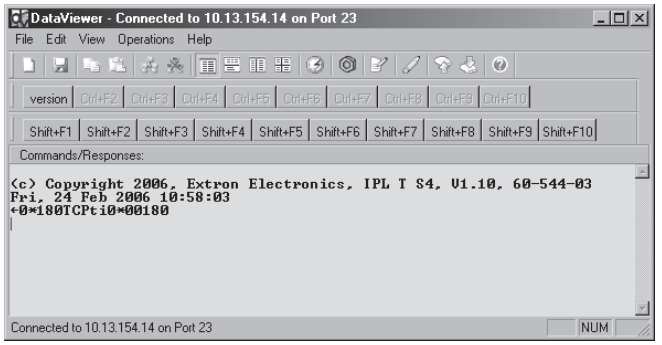
DataViewer - Connected to 10.13.154.14 on Port 23
File Edit View Operations Help
version
Shift+F1 Shift+F2 Shift+F3 Shift+F4 Shift+F5 Shift+F6 Shift+F7 Shift+F8 Shift+F9 Shift+F10
Commands/Responses:
(c) Copyright 2006, Extron Electronics, IPL T S4, V1.10, 60-544-03
Fri, 24 Feb 2006 10:58:03
+0*180TCPti0*00180
Connected to 10.13.154.14 on Port 23
NUM

Figure 4-2 — DataViewer main window

You are now ready to communicate with the IPL T S interface.

To disconnect the PC from the IP Link Device, click the Disconnect button or select Disconnect from the File menu.

Accessing and using the default Web pages

The IPL T S interface comes with a set of preloaded default Web pages. These pages can be used to configure certain settings on the IPL T S.

Web browsers such as Netscape Navigator (version 6.0 or higher), or Internet Explorer (version 5.5 or higher) can be used, but if using Internet Explorer, you must also have Microsoft Script (version 5.6 or higher).

NOTE *When viewing Web pages within the GlobalViewer software, Internet Explorer is the only compatible browser.*

The PC used to access an IPL T S unit's Web server must have a connection in common with the IPL T S interface (i.e., both the unit and the PC must be connected to your local intranet or Internet).

If you have previously established passwords for the interface, a Password dialog box appears when your browser accesses the IPL T S unit.

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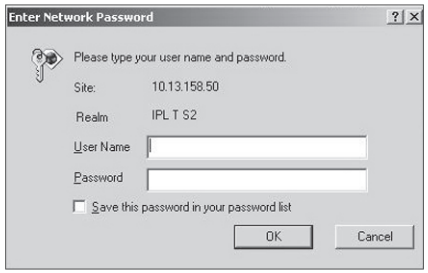

Figure 4-3 — Web server Password dialog box

Your level of control over the interface depends on the password you enter. If you enter the *administrator's* password, you can control all aspects of configuration. If you enter a *user* password, you are restricted to viewing status.

Logon and system status

To log on to an IPL T S' Web server, do the following:

1. Double-click the Web browser icon on your Windows desktop to launch your Web browser.
2. Enter the IP address of the unit (see "IPL T S interface configuration" in chapter 3) in the address field at the top of the screen and press the Enter key. The Password dialog box (figure 4-3) is displayed if a password has been set (this does not happen the first time you access the interface, as no password is set at the factory).
3. Click OK.

   The System Status page (figure 4-4) is displayed, showing the current IP and port settings of the unit.

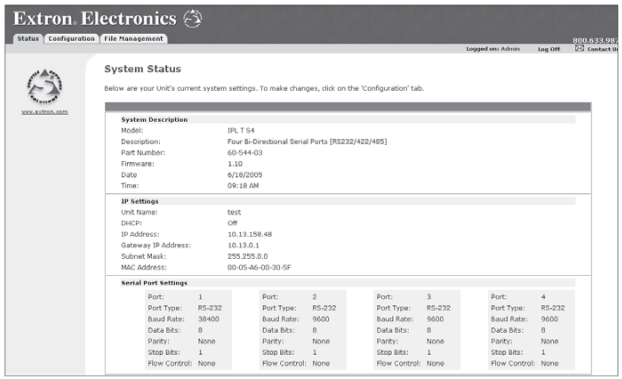

Figure 4-4 — Web server System Status screen

Establishing or changing system or port settings

The System Settings screen is used to initially configure or change configuration of the IPL T S interface. You may be required to change system settings if your network changes, or if port settings change as you add or change display devices or switchers. **To configure system or port settings, do the following:**

1. Click on the Configuration tab. The System Settings screen (figure 4-5) is displayed.

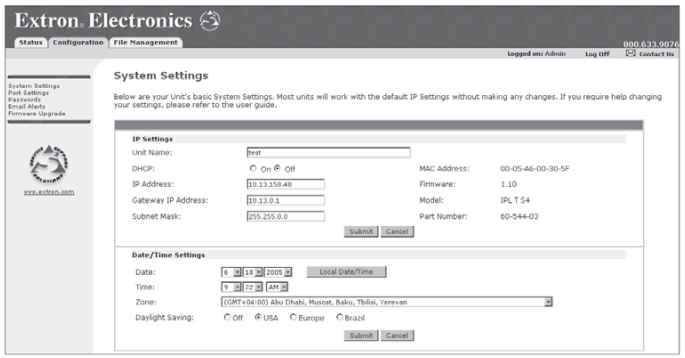

Figure 4-5 — Web server System Settings screen

2. Make changes to the IP Settings or Date/Time settings, as necessary.

NOTE *IP Link products support United States (USA), European Union (EU), and Brazil Daylight Saving Time (DST) or "Summer Time".*

3. Click the Submit button to enter the changes, or click the Cancel button to revert to the previous settings.
4. Click on Port Settings on the menu (on the left side of the window). The Port Settings screen (figure 4-6) is displayed.

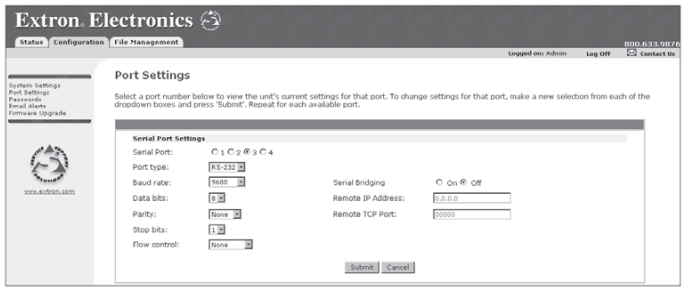

Figure 4-6 — Web server Port Settings screen

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5. Select the desired port and make changes to the port settings, as necessary.
6. Click the Submit button to enter the changes, or click the Cancel button to revert to the previous settings.

Setting and changing your passwords

For security reasons you may want to set passwords initially, or change passwords either periodically or on a scheduled basis. If passwords have been set, you must log on as an administrator to change them.

To set or change the passwords:

1. Click on Passwords on the menu (on the left side of the window). The Passwords screen (figure 4-7) is displayed.
2. Enter the passwords for administrator and/or user, then reenter the same passwords to confirm.
3. Click the Submit button to enter the changes, or click Cancel to revert to previous settings. If the fields are left blank, no passwords have been assigned.

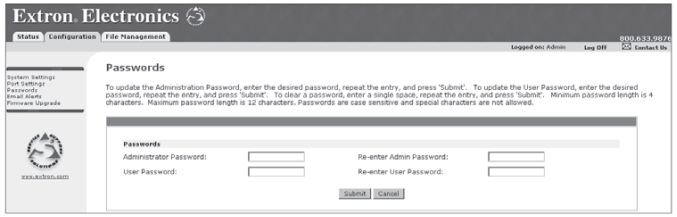

Figure 4-7 — Web server Passwords screen

4. Once passwords have been set, you are required to enter a password (figure 4-3) whenever you log on to the unit.

NOTE *To clear a password, enter a single space, repeat the entry, and press Submit.*

NOTE *If there is no administrator password, your user password is not saved.*

Editing and adding e-mail alerts

If you have created scheduled events or monitoring tasks through the Global Configurator software, you probably have e-mail alerts with a message corresponding to an event or task (e.g., a timer notification indicating that it's time to replace a projector light bulb).

These Web pages allow you to conveniently make changes to your alerted e-mail addresses and to change your message file.

NOTE *Initial setup and settings changes must be made in the Global Configurator software.*

The e-mail alert can notify up to 64 recipients at one time. **To edit notification e-mail addresses from the E-mail Alerts page, do the following:**

1. Click E-mail Alerts on the menu (on the left side of the window). The E-mail Alerts screen (figure 4-8) is displayed.

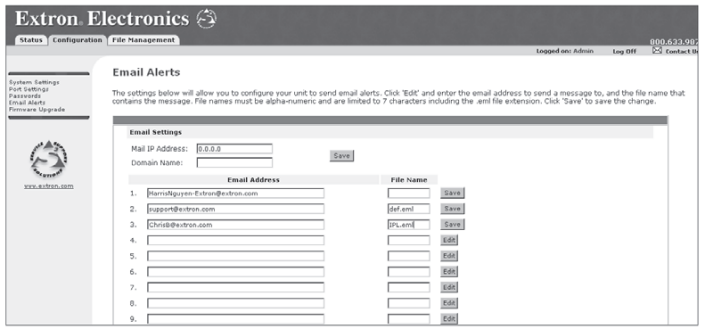

Figure 4-8 — E-mail Alerts screen

2. Click the Edit button to enter edit mode (this updates the button from Edit to a Save).
3. Add, update, or change the IP address and domain name of your mail server under E-mail Settings.
4. Click the Save button to keep changes.
5. Click the Edit buttons to independently edit each E-mail Address and File Name.
   a. Under E-mail Address, enter the e-mail address of the alert recipient in one of the numeric mailboxes.
   b. Under File Name, enter the name of the file containing the alert message.
   c. Click Save to keep changes to recipient e-mail addresses and file names.

CAUTION *File names* must *end with an .eml extension.*

NOTE *Due to the seven character limit for full file names, it is advised that you use numeric titles (e.g., 1.eml, 24.eml). Numeric titles reduce the characters of the file name, and assist in keeping the alert files organized. However, alphabetical titles are permitted.*

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To finalize your new e-mail alerts within the Web server, do the following:

6. Obtain the gateway IP address from your system administrator.
7. Click System Settings on the menu (figure 4-5) on the left side of the window.
8. Type the gateway IP address into the Gateway IP Address field.

Sending an e-mail alert through DataViewer

To complete the process of sending an e-mail alert, you must send it through DataViewer and receive confirmation. To do so:

1. Open DataViewer. For instructions on how to do this, see "Extron DataViewer", earlier in this chapter.
2. Use the "Send e-mail" SIS command to send the alert to the e-mail address of a numeric mailbox. Refer to the *Command/response table for Simple Instruction Set (SIS) commands*, later in this chapter, for the specific command code.

For example, the code for sending an alert from the 4th numeric mailbox (as seen in the E-mail Alerts screen, figure 4-8) would be

Esc 4 SM ←

For detailed information on creating, monitoring, and scheduling alerts, see the *Global Configurator Help file* within the Global Configurator software.

Upgrading the firmware

Firmware upgrades become available periodically, as improvements are made to the versatility and functionality of the IPL T S interface. These upgrades are available for download from the Internet.

CAUTION *The firmware file you select to upload must have the extension ".S19". Uploading an incorrect file may cause your unit to stop working.*

To upgrade the firmware, do the following:

1. Click Firmware Upgrade on the menu (on the left side of the window). The Firmware Upgrade screen (figure 4-9) is displayed.

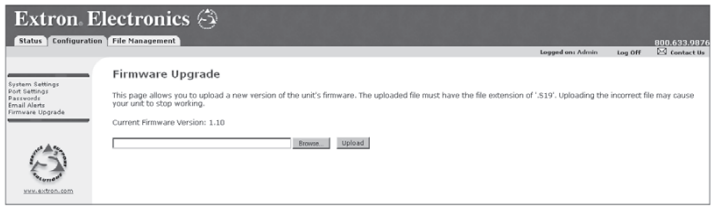

Figure 4-9 — Web server Firmware Upgrade screen

2. Click the Browse button to find the path *Program Files/Extron/Firmware* or the most current available version of the firmware.

   If you find a later version than the one shown above the text box, click Upload to upgrade to the newer version.

CAUTION *If you close the page before the upload is complete, the action is cancelled.*

Managing files

The File Management page is a useful tool that allows you to use and upload existing and custom Web pages. Custom pages can be developed using a third-party Web page development program such as FrontPage® or Dreamweaver®. File management also allows you to remove unnecessary or outdated files when they are no longer needed.

To add or update files, do the following:

1. Select the File Management tab. The File Management screen (figure 4-10) is displayed.

Figure 4-10 — Web server File Management screen

2. Click the Browse button to locate the file(s) you want to upload.

NOTE *If you want one of the pages that you create and upload to be the default start-up page, name that file "index.html" in the root directory.*

3. Click the Upload File button to upload the file.

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The uploaded file is added to the list of files under the Files column.

You can also create directories within the File Management page. **To create a directory, do the following:**

1. Enter the new directory name in the Dir field alongside the forward slash.
2. Click the Add Dir button. The new directory opens.
3. Click the Browse button, locate your chosen file, and double click.
4. Click the Upload File button. The new file appears under the Files column.

NOTE *A new directory does* not *appear on the root level unless a file has been placed within it.*

To delete unwanted files or directories, do the following:

1. Find the file or directory you wish to delete under the Files column.
2. Click the Delete button of the file or directory to be deleted. If you wish to delete additional files, wait for the screen to refresh before clicking the Delete button of the next file.

If you wish to delete all files, click the Delete All button from the root directory. The file count on the File Management page (figure 4-9) reverts to 0, and all subsequent pages are deleted.

NOTE *If the last file in a directory is deleted, the empty directory is automatically deleted.*

Programmer's Guide for Telnet and Web Browsers

Using the command/response table

The following are either Telnet (port 23) or Web browser (port 80) commands. There are some minor differences when you are implementing these commands via Telnet or via URL encoding using a Web browser. All commands listed below work using either connection method; but, due to some limitations of the Web browser, the encapsulation characters are modified to make sure that the Web browser properly handles them. All examples in the command/response table on page 4-14 show the proper implementation in a Telnet or Web browser session.

NOTE ***Note for Web browsers****: all non-alphanumeric characters must be represented as their hex equivalent, for example, %xx where xx equals the two character representation of the hex byte that needs to be sent (e.g., a comma would be represented as %2C).*

Telnet	Web Browser
Escape (Hex 1B)	W [must **not** be encoded]
Carriage Return (Hex 0D)	Pipe Character (¦) [must **not** be encoded]

When these commands are used through a Web browser, the URL reference is used below to shorten the examples. This would in practice be the full URL of the control interface and Web page reference including all path information. For example, **http://192.168.100.10/myform.htm**.

To send any of the commands using a Web browser, you need to prefix them with the full URL followed by **?cmd=**. See *URL Encoding*, later in this chapter.

NOTE *With Telnet you can use either the "Escape" commands with the carriage return or the "W" commands with the pipe (¦) character. With the Web browser you are required to use the "W" commands and the pipe character.*

The *Command/response table for Simple Instruction Set (SIS) commands* later in this chapter lists the commands that the IPL T S interface recognizes as valid, the responses that are returned to the host, a description of the command's function or the results of executing the command, and an example of each command in ASCII (Telnet) and URL Encoded (Web).

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NOTE *Upper- and lowercase text can be used interchangeably except where noted.*

Symbol definitions are shown below. An ASCII to HEX conversion table is also provided in figure 4-11 (below).

ASCII to HEX Conversion Table															
	20	!	21	"	22	#	23	$	24	%	25	&	26	'	27
(	28	)	29	*	2A	+	2B	,	2C	-	2D	.	2E	/	2F
0	30	1	31	2	32	3	33	4	34	5	35	6	36	7	37
8	38	9	39	:	3A	;	3B	<	3C	=	3D	>	3E	?	3F
@	40	A	41	B	42	C	43	D	44	E	45	F	46	G	47
H	48	I	49	J	4A	K	4B	L	4C	M	4D	N	4E	O	4F
P	50	Q	51	R	52	S	53	T	54	U	55	V	56	W	57
X	58	Y	59	Z	5A	[	5B	\	5C	]	5D	^	5E	_	5F
`	60	a	61	b	62	c	63	d	64	e	65	f	66	g	67
h	68	i	69	j	6A	k	6B	l	6C	m	6D	n	6E	o	6F
p	70	q	71	r	72	s	73	t	74	u	75	v	76	w	77
x	78	y	79	z	7A	{	7B	|	7C	}	7D	~	7E	DEL	7F
Esc	1B														
CR	0D														
LF	0A														

Figure 4-11— ASCII-to-HEX conversion table

Symbol definitions

↵ = CR/LF (carriage return/line feed)

← = Carriage return (no line feed)

• = Space character

X1 = Specific port number (01-99)

The port number is represented as two ASCII characters (2 bytes). For example: port 05 would be represented as 30 35 in hex.

X2 = Command data section

X2 is the command string for sending data to an A/V product (e.g., a switcher or projector) attached to an IPL T S unit. For remote processing examples, see "Customization" later in this chapter.

NOTE *See "URL Encoding" for command restrictions.*

X3 = Greenwich Mean Time (GMT) offset value (-12.0 to +14.0)

X5 = On/Off status: 0 = Off/Disable; 1 = On/Enable

X11 = Unit version number

X12 = Name is a text string up to 24 characters drawn from the alphabet (A-Z), digits (0-9), minus sign/hyphen (-). No blank or space characters are permitted as part of a name. No distinction is made between upper and lower case. The first character must be an alpha character. The last character must **not** be a minus sign/hyphen.

X13 = Set local date and time format (MM/DD/YY-HH:MM:SS) (e.g., 02/01/06-10:54:00)

Read local date and time format (day of week, date month year HH:MM:SS) (e.g., Tues, 14 Feb 2006 18:19:33)

X14 = IP address (xxx.xxx.xxx.xxx). Leading zeros in each of four fields are optional in setting values, and are suppressed in returned values.

X15 = Domain name (e.g., extron.com, icia.org)

X17 = Time in tens of milliseconds to wait for characters coming into a serial port before terminating (default=1=10 ms, max.=32767)

X18 = Hardware (MAC) address (xx-xx-xx-xx-xx-xx)

X19 = Subnet mask (xxx.xxx.xxx.xxx). Leading zeros in each of four fields are optional in setting values, and are suppressed in returned values.

X20 = Time in tens of milliseconds to wait between characters coming into a serial port before terminating (default=2=20 ms, max.=32767)

X21 = Parameter to set either **L**ength of message to receive or **D**elimiter value. If length delimited, use xxL, where xx is the length of the incoming message in bytes. If character delimited, use xxD, where xx is the decimal ASCII value of the delimiting character.

X22 = Verbose/response Mode: 0=clear/none; 1=verbose mode; 2=tagged responses for queries; 3=verbose mode and tagged responses for queries. (Default = 0 for Telnet connections, 1 for RS-232 host control).

NOTE *If tagged responses is enabled, all read commands return the constant string + the data, like setting the value does. For example,* ***Command: Esc CN ← Response: Ipn • X12 ←.***

X23 = Priority status for receive timeout:
0 = priority set to Send Data String command parameters;
1 = priority set to Configure Receive Timeout command parameters.

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X25 = Baud rate: 300, 600, 1200, 1800, 2400, 3600, 4800, 7200, 9600, 14400, 19200, 28800, 38400, 57600, 115200

X26 = Parity: **O**dd, **E**ven, **N**one, **M**ark, **S**pace (only the first letter is required)

X27 = Data bits: 7, 8

X28 = Stop bits: 1, 2

X29 = Port type: 0 = RS-232; 1 = RS-422; 2 = RS-485

X30 = Flow control: **H**ardware, **S**oftware, **N**one (only the first letter is needed)

X31 = Data pacing (specified in milliseconds between bytes): 0–1000 (default = 0 ms)

X33 = Password: allows a maximum length of 12 alpha numeric characters. Special characters are not allowed.

NOTE *User password cannot be assigned if no administrator password exists and returns E14. If an admin password is cleared, then the user password is removed too.*

X34 = Daylight saving time (DST) is a 1-hour offset (for the USA only) that begins on the first Sunday of April at 2 am and ends on the last Sunday of October. For example, time in California is GMT -8:00 from April to October and GMT -7:00 from November to March. DST should be turned off in Hawaii, American Samoa, Guam, Puerto Rico, the Virgin Islands, the eastern time zone portion of the state of Indiana, and the state of Arizona (excluding the Navajo Nation). 0 = off/ignore ; 1 = on

X35 = Event number: range = 0–99 (max.)

X36 = Event buffer: 0 = receive; 1 = user (absolute); 2 = user (relative); 3 = NVRAM

X37 = Memory location: range = 0–max.BufferSize

X38 = Event data size: b = bit; B = byte (8 bit); S = short (16 bit); L = long (32 bit)

NOTE *This parameter is case sensitive.*

X39 = Event data to write

X41 = Reading password: responds as empty if no password is set, and 4 asterisks (****) if password exists.

X44 = Number of bytes to read: range = 1–127 (max.)

X45 = E-mail event number: range = 1–48 (max.)

X46 = E-mail recipient address

X47 = Name of e-mail file to be sent.

NOTE *E-mail files must have the file extension .eml.*

X49 = Default name: a combination of the model-name and the last 3 pairs of the MAC address (e.g., IPL-T-S2-00-02-3D)

X50 = Redirect: 0 = no redirect; 1–n = redirect serial port from the specified port to allow for a transparent pass-through mode

X52 = Connection's security level: 0 = not logged in; 1 = user; 2 = administrator

X53 = Timeout for data pass through mode, after which event data can be inserted into the transmit buffer.

X54 = ASCII digit(s) representing numeric value of data element read from event buffer. (Leading zeros are suppressed.)

X64 = Time in seconds to keep sending the broadcast message (0–255, default=10)

X69 = The number of seconds before timeout on IP connections: (min.=1; max.=65000; default=30=300 seconds). If no data is received during the timeout period, the Ethernet connection is closed. Each step = 10 seconds. When connected via RS-232, only the global timeout commands apply. Current returns E13. The response is returned with leading zeros.

NOTE X69 *is applicable to Ethernet only.*

X70 = Number (as optional parameter) inserted into an e-mail message if the **.eml** file has an embedded ESC CR command with no parameters.

X71 = Hardware (MAC) address: the four most significant hex nibbles converted into a single 16-bit decimal number.

X72 = Hardware (MAC) address: the eight least significant hex nibbles converted into single 32-bit decimal number.

NOTE *This could be as large as 10 digits.*

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Mon, 17 Feb 2006 11:27:33↵
The copyright message is displayed upon connecting to the IP Link product via TCP/IP or Telnet. Sx is the model and Vx.xx is the firmware version number. The current date and time is displayed. This is followed by a password prompt.

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Password information

The "↵Password:" prompt requires a password (administrator level or user level) followed by a carriage return. The prompt is repeated if the correct password is not entered.

If the correct password is entered, the unit responds with "↵Login Administrator↵" or "↵Login User↵", depending on the password entered. If the passwords are the same for both administrator and user, the unit defaults to administrator privileges.

Error responses

When the IPL T S interface receives a valid command, it executes the command and sends a response to the host device. If the unit is unable to execute the command because the command contains invalid parameters, it returns an error response to the host.

E12 — Invalid port number

E13 — Invalid parameter

E14 — Not valid for this configuration

E17 — System timed out

E22 — Busy

E24 — Privilege violation

E25 — Device not present

E26 — Maximum number of connections exceeded

E27 — Invalid event number

E28 — Bad filename/file not found

References to errors (at command descriptions on the following pages)

[24] = Commands that give an E24 (privilege violation) error if not administrator level

[27] = Commands that may give an E27 (invalid event number) error

[28] = Commands that may give an E28 (file not found) error

Command/response table for Simple Instruction Set (SIS) commands

Command	ASCII (Telnet)	URL Encoded (Web)	Response
Bidirectional Serial Data Port			
Send data string	Esc X1*X17*X20*X21 RS ↓ X2	W X1 %2A X17 %2A X20 %2A X21 RS | X2	Response from command ↵
Configure parameters[24]	Esc X1*X25,X26,X27,X28 CP ↓	W X1 %2A X25 %2C X26 %2C X27 %2C X28 CP |	Cpn X1 • Ccp X25,X26,X27,X28 ↵
View parameters	Esc X1 CP ↓	W X1 CP |	X25,X26,X27,X28 ↵
Configure mode[24]	Esc X1 *X29 CY ↓	W X1 %2A X29 CY |	Cpn X1 • Cty X29 ↵
View mode	Esc X1 CY ↓	W X1 CY |	X29 ↵
Configure flow control[24]	Esc X1 * X30, X31 CF ↓	W X1 %2A X30 %2C X31 CF |	Cpn X1 • Cfl X30, X31 ↵
View flow control	Esc X1 CF ↓	W X1 CF |	X30, X31 ↵
Configure receive timeout[24]	Esc X1*X17*X20 *X23*X21 CE ↓	W X1 %2A X17 %2A X20 %2A X23 %2A X21 CE |	Cpn X1 • Cce X17, X20, X23 X21 ↵
View receive timeout	Esc X1 CE ↓	W X1 CE |	X17, X20, X23, X21 ↵
Configure pass-thru mode[24]	Esc X1*X50*X53*X21 CD ↓	W X1 %2A X50 %2A X53 %2A X21 CD |	Cpn X1 • Ccd X50, X53, X21 ↵
Terminate pass-thru mode[24]	Esc X1 * 0CD ↓	W X1 %2A 0CD |	Cpn X1 • Ccd 00000, 00000, 00000 L ↵
View pass-thru mode	Esc X1 CD ↓	W X1 CD |	X50, X53, X21 ↵
Ethernet Data Port			
Set current connection port timeout	Esc 0*X69 TC ↓	W0 %2A X69 TC |	Pti 0*X69 ↵
View current connection port timeout	Esc 0TC ↓	W0TC |	X69 ↵
Set global IP port timeout	Esc 1*X69 TC ↓	W1 %2A X69 TC |	Pti 1*X69 ↵
View global IP port timeout	Esc 1TC ↓	W1TC |	X69 ↵

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Command	ASCII (Telnet)	URL Encoded (Web)	Response
Firmware Version/Part Number/Information			
Query firmware version	Q	Q	X11 ↵
Query firmware version	*With tagged response, verbose modes 2/3*		*Ver01 * X11 ↵*
Query verbose version information	0Q	0Q	Sum of responses from 2Q-3Q-4Q ↵
Query verbose version information	*With tagged response, verbose modes 2/3*		*Ver00 * sum of responses from 2Q-3Q-4Q ↵*
Query firmware version	1Q	1Q	X11 ↵
Query firmware version	*With tagged response, verbose modes 2/3*		*Ver01 * X11 ↵*
Query bootstrap version	2Q	2Q	X11 ↵
Query bootstrap version	*With tagged response, verbose modes 2/3*		*Ver02 * X11 ↵*
Query factory firmware version	3Q	Q	X11 ↵ (plus Web ver.-desc-UL date/time) ↵
Query factory firmware version	*With tagged response, verbose modes 2/3*		*Ver03 * X11 ↵ (plus Web ver.-desc-UL date/time) ↵*
Query updated firmware version	4Q	4Q	X11 ↵ (plus Web ver.-desc-UL date/time) ↵
Query updated firmware version	*With tagged response, verbose modes 2/3*		*Ver04 * X11 ↵ (plus Web ver.-desc-UL date/time) ↵*
NOTE	*An asterisk (*) placed after the version number indicates which version is currently running. A question mark (?.??) indicates that only the factory firmware version is loaded. A caret (^) after the version number indicates the firmware version that should be running, but a Mode 1 reset was executed. The default factory firmware version is loaded. An exclamation point (!) after the version number indicates corrupted firmware.*		
Query part number	N	N	60-xxx-yy ↵
Query part number	*With tagged response, verbose modes 2/3*		*Pno 60-xxx-yy ↵*
Query model name	1I	1I	IPL T xxxx ↵
Query model name	*With tagged response, verbose modes 2/3*		*Inf 01 * IPL T xxxx ↵*
Query model description	2I	2I	Two Bi-Directional Serial Ports [RS232/422/485] ↵
Query model description	*With tagged response, verbose modes 2/3*		*Inf 02 * Two Bi-Directional Serial Ports [RS232/422/485] ↵*

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Command	ASCII (Telnet)	URL Encoded (Web)	Response
Firmware Version/Part Number/Information, continued			
Query system memory usage	3I	3I	# Bytes used out of # Kbytes ↵
Query system memory usage	*With tagged response, verbose modes 2/3*		*Inf 03 * Two Bi-Directional Serial Ports [RS232/422/485] ↵*
Query user memory usage	4I	4I	# Bytes used out of # Kbytes ↵
Query user memory usage	*With tagged response, verbose modes 2/3*		*Inf 04* # Bytes used out of # Kbytes ↵*
E-mail			
Configure e-mail events (mailbox)[24]	Esc X45, X46, X47CR ←	W X45 %2C X46 %2C X47CR |	Ipr X45, X46, X47 ↵
View e-mail events (mailbox)	Esc X45CR ←	W X45 CR |	X46, X47 ↵
Send e-mail (file named in mailbox)[24]	Esc X45SM ←	W X45 SM |	Eml X45 ↵
Send e-mail (using different file)[24]	Esc X45, X70, X47SM ←	W X45 %2C X70 %2C X47SM |	Eml X45 ↵
Mail-server Setup			
Set mail sever IP, unit domain name[24]	Esc X14, X15 CM ←	W X14 %2C X15 CM |	Ipm • X14, X15 ↵
View mail sever IP, unit domain name	Esc CM ←	WCM |	X14, X15 ↵
Web Browser Specific			
Read response from last URL cmd	Esc UB ←	WUB |	Response from command ↵
IP Setup Commands			
Set unit name[24]	Esc X12CN ←	W X12 CN |	Ipn • X12 ↵
Set unit name to factory default[24]	Esc•CN ←	W%20CN |	Ipn • X49 ↵
View unit name	Esc CN ←	WCN |	X12 ↵
Set date/time[24]	Esc X13CT ←	W X13 CT |	Ipt • X13 ↵
View date/time	Esc CT ←	WCT |	X13 ↵
Set GMT offset[24]	Esc X3CZ ←	W X3 CZ |	Ipz X3 ↵

Command	ASCII (Telnet)	URL Encoded (Web)	Response
IP Setup Commands, continued			
View GMT offset	Esc CZ ←	WCZ|	X3 ↵
Set daylight saving time[24]	Esc X34 CX ←	W X34 CX|	Ipx X34 ↵
View daylight savings	Esc CX ←	WCX|	X34 ↵
Set DHCP on[24]	Esc 1DH ←	W1DH|	Idh 1 ↵
Set DHCP off[24]	Esc 0DH ←	W0DH|	Idh 0 ↵
NOTE	*Changing DHCP from on to off resets the IP address to the factory default (192.168.254.254).*		
View DHCP mode	Esc DH ←	WDH|	X5 ↵
Set IP address[24]	Esc X14 CI ←	W X14 CI|	Ipi • X14 ↵
View IP address	Esc CI ←	WCI|	X14 ↵
View hardware address (MAC)	Esc CH ←	WCH|	Iph • X18 ↵
View hardware address (MAC)	*With tagged response – verbose modes 2/3*		*Iph• X18 ↵*
Set subnet mask[24]	Esc X19 CS ←	W X19 CS|	Ips • X19 ↵
View subnet mask	Esc CS ←	WCS|	X19 ↵
Set gateway IP address[24]	Esc X14 CG ←	W X14 CG|	Ipg • X14 ↵
View gateway IP address	Esc CG ←	WCG|	X14 ↵
Set verbose mode[24]	Esc X22 CV ←	W X22 CV|	Vrb X22 ↵
View verbose mode	Esc CV ←	WCV|	X22 ↵
Set broadcast mode	Esc X64, X14 EB ←	W X64 %2C X14 EB|	Bmd X64, X14 ↵
Set broadcast mode to default address	Esc X64 EB ←	W X64 EB|	Bmd X64, X14 ↵
Clear broadcast mode	Esc 0EB ←	W 0EB|	Bmd 000, X14 ↵
View broadcast mode	Esc EB ←	W EB|	X64, X14 ↵
Set broadcast port and MAC	Esc {port#} * X71 * X72 PB ←	W {port#} * X71 * X72 PB|	Bpt {port#} * X18 ↵
View broadcast port and MAC	Esc PB ←	W PB|	{port#} * X18 ↵
NOTE	{port#} = *UDP outgoing port,* X71 * X72 = *MAC address for UDP unicast transmissions.*		
NOTE	*Changes to the PB command become effective in kernel versions 1.53 or higher.*		

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Command	ASCII (Telnet)	URL Encoded (Web)	Response
Password and Security Settings			
Set administrator password[24]	Esc X33 CA ←	W X33 CA|	Ipa • X41 ↵
Clear administrator password[24]	Esc • CA ←	W%20CA|	Ipa • ↵
View administrator password[24]	Esc CA ←	WCA|	X41 ↵
Set user password[14, 24]	Esc X33 CU ←	W X33 CU|	Ipu • X41 ↵
Clear user password[24]	Esc • CU ←	W%20CU|	Ipu • ↵
View user password[24]	Esc CU ←	WCU|	X41 ↵
Query session's security level	Esc CK ←	WCK|	X52 ↵
Re-map port designations			
Set Telnet port map[24]	Esc {port#}MT ←	W{port#}MT|	Pmt {port#} ↵
Reset Telnet port map[24]	Esc 23MT ←	W23MT|	Pmt 00023 ↵
Disable Telnet port[24]	Esc 0MT ←	W0MT|	Pmt 00000 ↵
View Telnet port map[24]	Esc MT ←	WMT|	{port#} ↵
Set Web port map[24]	Esc {port#}MH ←	W{port#}MH|	Pmh {port#} ↵
Reset Web port map[24]	Esc 80MH ←	W80MH|	Pmh 00080 ↵
Disable Web port[24]	Esc 0MH ←	W0MH|	Pmh 00000 ↵
View Web port map[24]	Esc MH ←	WMH|	{port#} ↵
Set Direct Access port map[24]	Esc {port#}MD ←	W{port#}MD|	Pmd {port#} ↵
Reset Direct Access port map[24]	Esc 2001MD ←	W2001MD|	Pmd 02001 ↵
Disable Direct Access port[24]	Esc 0MD ←	W0MD|	Pmd 00000 ↵
View Direct Access port map[24]	Esc MD ←	WMD|	{port#} ↵
NOTE	*Duplicate port# assignments are not permitted (i.e., Telnet and Web cannot be the same) and result in an E13 (invalid parameter) response.*		

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Command	ASCII (Telnet)	URL Encoded (Web)	Response
Directories			
Change/create directory	Esc path/directory/CJ ←	W path/directory/CJ|	Dir • path/directory/ ↵
Back to root directory	Esc/CJ ←	W%2F CJ|	Dir • / ↵
Up one directory	Esc ..CJ ←	W%2E%2E CJ|	Dir • path / directory / ↵
View current directory	Esc CJ ←	WCJ|	path/directory/ ↵
Directory = *A text string drawn from the alphabet (A-Z), digits (0-9), minus sign/hyphen (-). No blank or space characters are permitted as part of a name. No distinction is made between upper and lower case. The first character must be an alpha character.*			
NOTE *A directory does not truly exist until a file has been copied into that path.*			
Erase user-supplied Web page / file[24, 28]	Esc filename EF ←	W filename EF|	Del • filename ↵
Erase current directory & its files[24, 28]	Esc /EF ←	W /EF|	Ddl ↵
Erase current directory & subdirectories[24, 28]	Esc //EF ←	W //EF|	Ddl ↵
List files from current directory	Esc DF ←	W DF|	
Get connection listing	Esc CC ←	W CC|	{Number of connections} ↵
Get connection listing	*With tagged response – verbose modes 2/3*		*Icc {number of connections}* ↵
Stream files via Telnet or RS-232			
Load file to user flash memory[24, 28]	Esc + UF filesize, filename ←	{raw unprocessed data in file up to filesize}	Upl ↵
Retrieve file from user flash memory[24, 28]	Esc filename SF ←	1B filename 53 46 0D	(Responds with 4 bytes of file size + raw unprocessed data in file)

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Command	ASCII (Telnet)	URL Encoded (Web)	Response
Stream files via port 80			
Load file to user flash memory	Use a POST on port 80 followed by the delimited data to be written to the flash file memory.		
Retrieve file from user flash memory	Send a page GET on port 80 followed by:WSF|	{responds with raw unprocessed data in file}, *i.e. http://192.168.254.254/mypage.html?cmd=WSF|*	
Event Control			
Read event buffer memory[27]	Esc X35, X36, X37, X38E ←	W X35%2CX36%2CX37X38E|	X54 ↵
Write event buffer memory[24, 27]	Esc X35, X36, X37, X39 X38E ←	W X35%2CX36%2CX37%2CX39 X38E|	Evt X35, X36, X37, X39 ↵
NOTE *Response to Write Event is padded with leading zeros for X35 & X37: X35 = 5 digits, X37 = 10 digits.*			
Read string from event buffer memory[27]	Esc X35, X36, X37, X44FE ←	W X35%2CX36%2CX37%2Cx44FE|	{string } ↵
Write string to event buffer memory[24, 27]	Esc {string }* X35, X36, X37FE ←	W X39 %2AX35%2CX36%2CX37FE|	Evt X35, X36, X37, {string} ↵
NOTE *'F' must be capitalized to read and write strings to event buffer memory.*			
NOTE *Response to Write Event is padded with leading zeros for X35 & X37: X35 = 5 digits, X37 = 10 digits.*			
Start events[24, 27]	Esc 1AE ←	W1AE|	Ego ↵
Stop events[24, 27]	Esc 0AE ←	W0AE|	Est ↵
Query number of events running	Esc AE ←	WAE|	##### ↵ (5 digit number)

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Command	ASCII (Telnet)	URL Encoded (Web)	Response
Reset(Zap)/ Erase Commands			
Erase all files from flash memory[24]	Esc ZFFF ↓	WZFFF|pf↵	Zpf↵
Reset all device settings to factory default[24]	Esc ZXXX ↓	WZXXX|	Zpx↵
NOTE *This is a product-dependent reset: flex I/O defaults back to TTL input, contact closure defaults to open, relays are reset to open, current sensing thresholds are reset to default, receive time-outs are reset back to defaults, port redirects are terminated. Consult product specific documentation for settings affected and default values. Excludes IP settings such as IP address, subnet mask, gateway IP address, and IP security-level table, and does not remove the file system.*			
Absolute system reset, but retain IP[24]	ESC ZY ↓	WZY|	Zpy↵
NOTE *This reset is the same as ZQQQ except that it excludes IP settings such as IP address, subnet mask, gateway IP address, unit name, DHCP setting, and port mapping (Telnet/Web/direct access) in order to preserve communication with the device. (This reset is recommended after a firmware update.) It erases the file system.*			
NOTE *The ZY command appears in kernel versions 1.45 or higher.*			
Absolute system reset[24] (Mode 5) resets all device settings to factory default; however, the firmware version remains the same.	ESC ZQQQ ↓	WZQQQ|	Zpq↵
NOTE *Unlike various PC operating systems, a file and directory on the Extron product are allowed to have the same name.*			

Customization

In the IPL T S interface series of products, varying degrees of customization are possible. The *Custom Web pages* section allows you to create customized Web pages to control your A/V devices. The *Server Side Includes* (SSI) section makes it possible to obtain information from the unit and to display it on Web pages. *URL encoding* allows you to send information and commands to the unit to change its configuration or to receive feedback.

Custom Web pages

These pages can be either modified versions of the existing default Web pages on the Web server, or new Web pages developed in the field.

Web page development can be done with a Web site development tool such as FrontPage® or Dreamweaver®. Custom Web pages are loadable through the Web server File Management page (see "Managing files" earlier in this chapter).

Server Side Includes (SSI)

SSIs are HTML commands that direct the Web server to dynamically generate data for a Web page whenever requested. SSIs typically use Extron's Simple Instruction Set (SIS) to communicate commands to the products or to attached control devices. Using SSIs, you can design and display custom pages with the IPL T S information provided by the SIS commands.

The basic format for an Extron SSI is:

<!—#echo var="x"—>
Where x is the SIS command to be executed.

The SIS instructions sent to IP Link-enabled products fall into two categories: host or remote.

- **Host** commands instruct the IP Link product to act or respond.
- **Remote** commands instruct an A/V product (e.g., a switcher or projector) to act or respond through an IPL T S unit.

When a Web page is requested, the Web server removes the SSI and replaces it with the answer to the SIS command within quotes.

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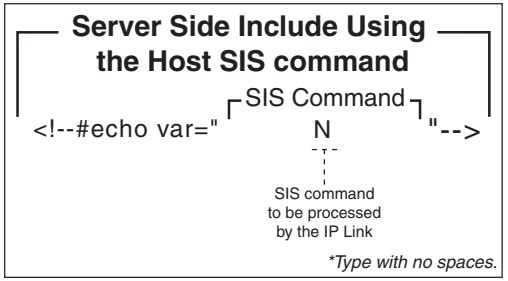


Figure 4-12 — Example of an SSI host command

In figure 4-12 above, the "N" command is used to request the IPL T S product's part number.

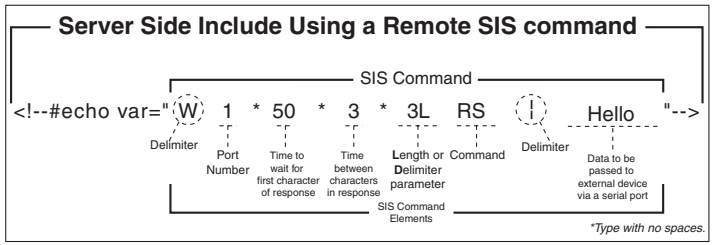

Server Side Include Using a Remote SIS command
SIS Command
<!--#echo var="
W
1
*
50
*
3
*
3L
RS
|
Hello
"-->
Delimiter
Port Number
Time to wait for first character of response
Time between characters in response
Length or Delimiter parameter
Command
Delimiter
Data to be passed to external device via a serial port
SIS Command Elements
*Type with no spaces.

Figure 4-13 — Example of SSI "remote" command

In figure 4-13 above, a "remote" serial command sends the word "Hello" and waits up to 50 ms for a response (until three characters are received). For more information on this command, refer to the *Command/response table for Simple Instruction Set (SIS) commands,* earlier in this chapter.

Query string

A query string is the portion of a URL that appears after the question mark. The query string contains parameters or instructions for the Web server to execute.

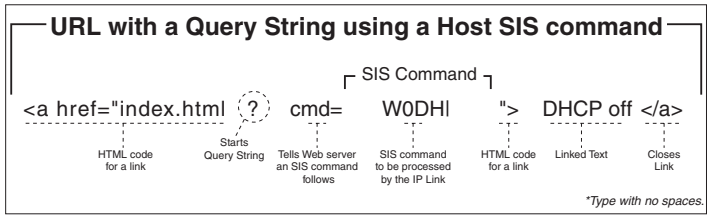
The basic format for a query string within a link is:

Input #1
Where x is the SIS command to be executed.

When a link is accessed on a Web page, the URL is passed to the Web server to tell it which Web page to return to the browser. The portion of the URL after the question mark is the query string, which contains the SIS command that the IPL T S interface removes and executes.

As with SSI formatted commands, query strings can use any valid SIS command—either "host" or "remote".

The query string in figure 4-14 below turns off DHCP on the IP Link device.


URL with a Query String using a Host SIS command
SIS Command
<a href="index.html
?
cmd=
W0DH|
">
DHCP off

HTML code for a link
Starts Query String
Tells Web server an SIS command follows
SIS command to be processed by the IP Link
HTML code for a link
Linked Text
Closes Link
*Type with no spaces.

Figure 4-14 — Example of a host query string command

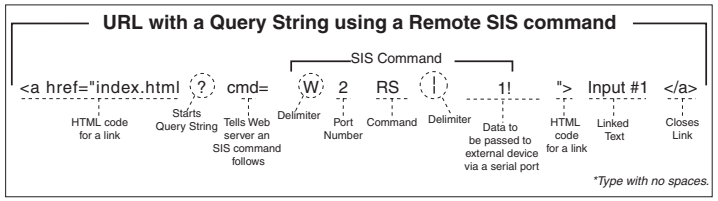


Figure 4-15 — Example of a remote query string command

In figure 4-15 above, the data string that follows the pipe (|) symbol is sent to the attached controlled device on serial port #2. This string instructs an attached Extron switcher to change to input #1.

Code examples

This section shows practical uses for both SSIs and query strings.

Example 1

In figure 4-16 on the following page, both host SSI and remote SSI commands are used within the same Web page. You will notice six SSIs: three host commands and three remote commands.

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```
<html>
<head><title>Example 1</title></head>
<h2 b>HTML Example #1</h2 b>
<body>
The following lines demonstrate how to read status from the IPLink Product:
<p>
IPLink Product Name: <b><!--#echo var="1I"--></b>          "host" SSI
<br>                                                        commands
IPLink Product Description: <b><!--#echo var="2I"--></b>
<br>
IPLink Product Part Number: <b><!--#echo var="N"--></b>
<br><hr>
<p>
This example requires an Extron Crosspoint 84HVA connected to IPL T S2
serial port #1.
<p>                                                         "remote" SSI
Part Number: <b><!--#echo var="W01RS|N"--></b>              commands
<br>
Connection Info: <b><!--#echo var="W01RS|I"--></b>
<br>
Firmware Version: <b><!--#echo var="W01RS|Q"--></b>
</body>
</html>
```

Figure 4-16 — Web page HTML source code document showing Server Side Includes

The host SSI commands in figure 4-16 request the product name, product description, and product part number of an IPL T S interface. The remote SSI commands request the part number, connection information and firmware version of an attached serial device.

```
<html>
<head><title>Example 1</title></head>
<h2 b>HTML Example #1</h2 b>
<body>
The following lines demonstrate how to read status from the IPLink Product:
<p>
IPLink Product Name: <b>IPL T S2</b>
<br>
IPLink Product Description: <b>Two Bi-Directional Serial Ports [RS232/422/485]</b>
<br>
IPLink Product Part Number: <b>60-544-01</b>
<br><hr>
<p>
This example requires an Extron Crosspoint 84HVA connected to IPL T S2 serial port #1.
<p>
Part Number: <b>N60-337-01%0D%0A</b>
<br>
Connection Info: <b>V08X04 A08X04 Exe0%0D%0A</b>
<br>
Firmware Version: <b>Ver2.02%0D%0A</b>
</body>
</html>
```

Figure 4-17a — Resulting HTML source code served by an IP Link Web server

Notice that, in figure 4-17a, the commands executed by the IPL T S2 in response to SSI references have been replied to, and were implemented when the Web page was served to the browser.

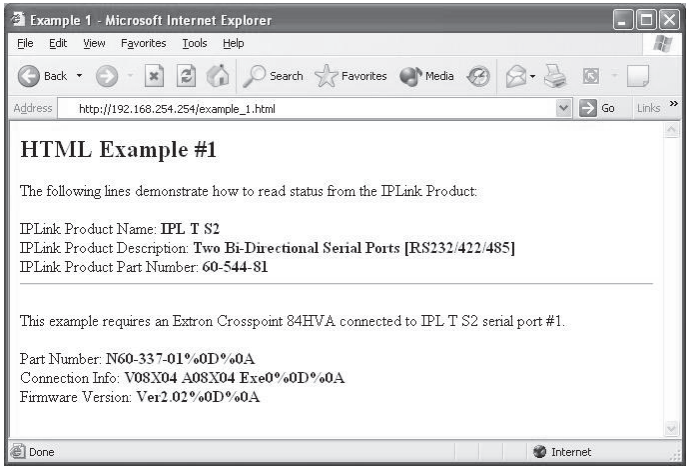
Example 1 - Microsoft Internet Explorer
File Edit View Favorites Tools Help
Back Search Favorites Media
Address http://192.168.254.254/example_1.html
Go Links
HTML Example #1
The following lines demonstrate how to read status from the IPLink Product:
IPLink Product Name: IPL T S2
IPLink Product Description: Two Bi-Directional Serial Ports [RS232/422/485]
IPLink Product Part Number: 60-544-81
This example requires an Extron Crosspoint 84HVA connected to IPL T S2 serial port #1.
Part Number: N60-337-01%0D%0A
Connection Info: V08X04 A08X04 Exe0%0D%0A
Firmware Version: Ver2.02%0D%0A
Done
Internet

Figure 4-17b — Browser view of previous HTML source code

Example 2

```
<html>
<head><title>Example 2</title></head>
<h2><b>HTML Example 2</b></h2>
<body>
The following lines demonstrate how to send commands to RS-232
Comm Port #1 of an IPLink Product:
<p>
<a href="index.html?cmd=W01RS|1!">Select Input #1</a>
<br>
<a href="index.html?cmd=W01RS|2!">Select Input #2</a>
</p>
</body>
</html>
```

Figure 4-18a — HTML source code showing multiple hyperlinks using query strings

The example above (figure 4-18a) shows how a simple hyperlink and a remote query string can be used to build a Web page that can control a device.

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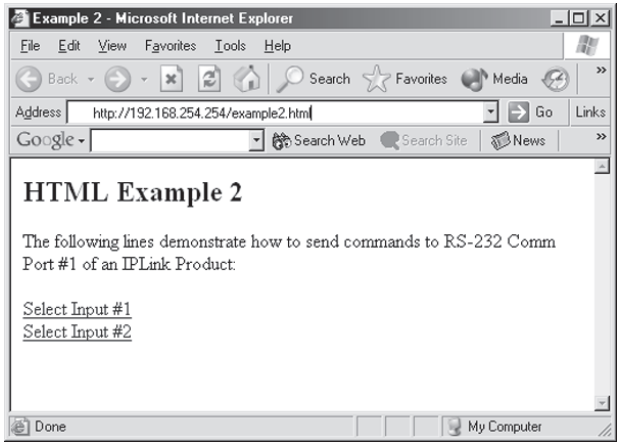
Example 2 - Microsoft Internet Explorer
File Edit View Favorites Tools Help
Back Search Favorites Media
Address http://192.168.254.254/example2.html
Go Links
Google Search Web Search Site News
HTML Example 2
The following lines demonstrate how to send commands to RS-232 Comm Port #1 of an IPLink Product:
Select Input #1
Select Input #2
Done
My Computer

Figure 4-18b — Browser view of previous HTML source code

NOTE *Before attempting to develop new Web pages, the user should have a working knowledge of JavaScript, HTML, and SSI.*

Example 3

```
<html>
<head><title>Example 3</title>
<script language="javascript">
xOut1 = "<!--#echo var="W01RS!V01%25"-->";
xOut2 = "<!--#echo var="W01RS!V02%25"-->";
xOut3 = "<!--#echo var="W01RS!V03%25"-->";
xOut4 = "<!--#echo var="W01RS!V04%25"-->";
</script>
</head>
<h2 b>HTML Example #3</h2 b>
<body>
This example requires an Extron Crosspoint 84HVA connected to IPL T 2 serial port #1.
<p>
<b>Sample links that can be followed</b>
<br>
<a href="http://192.168.254.254/example#3.html?cmd=W01RS!5*1!">
http://192.168.254.254/example#3.html?cmd=W01RS!5*1!<a><i> -Creates tie from
input 5 to output 1</i>
<br>
<a href="http://192.168.254.254/example#3.html?cmd=W01RS!1*2!">
http://192.168.254.254/example#3.html?cmd=W01RS!1*2!<a><i> -Creates tie from
input 1 to output 2</i>
<br>
<b>Response to last URL encoded command: </b> <!--#echo var="WUBI"-->
<br><hr>
The following lines demonstrate reading the output status of the Crosspoint.
<br>
<p><b>_____Unformatted Response:</b>
<br>
Output 1 Setup: <!--#echo var="W01RS!V01%25"-->
<br>
Output 2 Setup: <!--#echo var="W01RS!V02%25"-->
<br>
Output 3 Setup: <!--#echo var="W01RS!V03%25"-->
<br>
Output 4 Setup: <!--#echo var="W01RS!V04%25"-->
<br><hr>
Here is an example of formatting the results using Javascript in your HTML.
<br>
<p><b>_____Formatted Response:</b><p>
<script>
<!--
var x1Split= xOut1.split(" ");
var In1Split= x1Split[1].split("n");
document.write("Output 01 tied to Input " + In1Split[1] + "<br>");
var x2Split= xOut2.split(" ");
var In2Split= x2Split[1].split("n");
document.write("Output 02 tied to Input " + In2Split[1] + "<br>");
var x3Split= xOut3.split(" ");
var In3Split= x3Split[1].split("n");
document.write("Output 03 tied to Input " + In3Split[1] + "<br>");
var x4Split= xOut4.split(" ");
var In4Split= x4Split[1].split("n");
document.write("Output 04 tied to Input " + In4Split[1] + "<br>");
// -->
</script>
<br>
</body>
</html>
```

Figure 4-19a — Using JavaScript to parse the responses from a CrossPoint 84HVA to produce a formatted Web page

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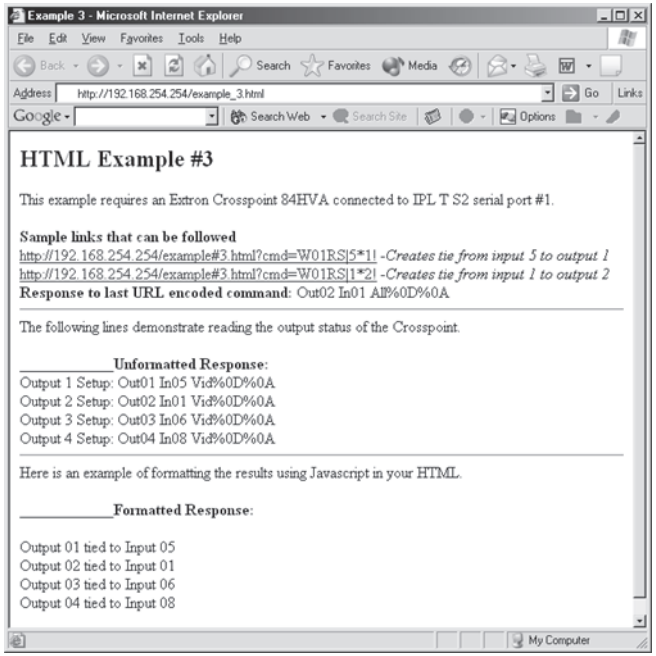
Example 3 - Microsoft Internet Explorer
File Edit View Favorites Tools Help
Address http://192.168.254.254/example_3.html
HTML Example #3
This example requires an Extron Crosspoint 84HVA connected to IPL T S2 serial port #1.
Sample links that can be followed
http://192.168.254.254/example#3.html?cmd=W01RS|5*1! -Creates tie from input 5 to output 1
http://192.168.254.254/example#3.html?cmd=W01RS|1*2! -Creates tie from input 1 to output 2
Response to last URL encoded command: Out02 In01 All%0D%0A
The following lines demonstrate reading the output status of the Crosspoint.
Unformatted Response:
Output 1 Setup: Out01 In05 Vid%0D%0A
Output 2 Setup: Out02 In01 Vid%0D%0A
Output 3 Setup: Out03 In06 Vid%0D%0A
Output 4 Setup: Out04 In08 Vid%0D%0A
Here is an example of formatting the results using Javascript in your HTML.
Formatted Response:
Output 01 tied to Input 05
Output 02 tied to Input 01
Output 03 tied to Input 06
Output 04 tied to Input 08
My Computer

Figure 4-19b — Resulting Web page creating links from input 5 to output 1 and input 1 to output 2

URL encoding

URL encoding is the method of using ASCII hexadecimal characters to display specific characters in a URL. URL encoding is used for several reasons. On some operating systems, certain characters are unsafe or not available, and others are reserved by the HTML or URL specification. URL encoding is used to insure compatibility and functionality with most Internet browsers. As a general rule, use the URL hexadecimal encoding method shown on the following page when these characters appear in your URLs.

The following types of characters *do not* require encoding in a URL:

Alphanumerics	0-9 a-z A-Z
Special characters	$ _ _ . + ! * ( ) ,
Reserved characters	; / ? : @ = & When used for their reserved purposes, these characters do not require encoding within a URL.

Reserved characters

Reserved characters should not be encoded when they appear in their conventional meaning in a URL. For example, do not encode the slash (/) when using it as part of the URL syntax. Only encode unsafe characters (defined below) in your URLs.

The following table lists reserved characters.

Characters		Hex	Dec
$	Dollar	24	36
&	Ampersand	26	38
+	Plus	2B	43
,	Comma	2C	44
/	Forward slash / virgule	2F	47
:	Colon	3A	58
;	Semi-colon	3B	59
=	Equal	3D	61
?	Question mark	3F	63
@	"At" symbol	40	64

Unsafe characters

URLs use some characters for "special use" in defining their syntax and should be encoded. For various reasons, these characters present the *possibility* of being misunderstood within a URL, and are therefore considered "unsafe".

The table on the following page lists unsafe characters.

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Characters		Hex	Dec
	Space	20	32
" "	Quotation marks	22	34
<	"Less than" symbol	3C	60
>	"Greater than" symbol	3E	62
#	Pound	23	35
%	Percent	25	37
Miscellaneous characters			
{	Left curly brace	7B	123
}	Right curly brace	7D	125
|	Vertical bar / pipe	7C	124
\	Backslash	5C	92
^	Caret	5E	94
~	Tilde	7E	126
[	Left square bracket	5B	91
]	Right square bracket	5D	93
`	Grave accent	60	96

Advanced Serial Port Control

If serial setup configurations are required, the following options provide advanced methods for communicating serially with the interface: serial pass-through (or redirect mode), direct port access, and serial bridging.

Serial pass-through (redirect mode)

Serial pass-through allows serial commands from a controller to "pass through" an IPL T S interface on route to an A/V device, as shown in figure 4-20 on the following page.

Any serial port on an IPL T S interface can be configured as a pass-through connection to another serial port on the same device.

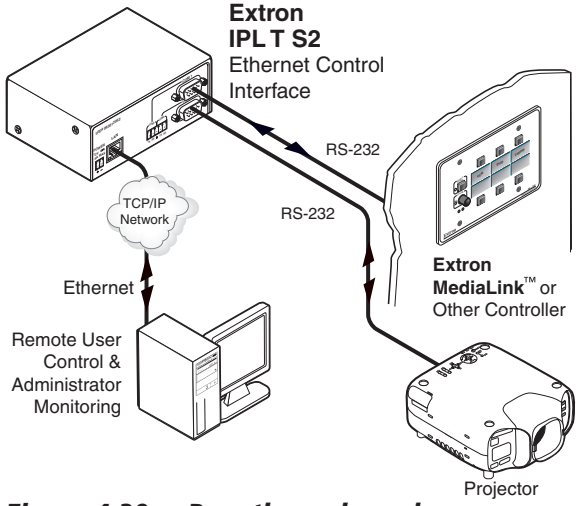

Figure 4-20 — Pass-through mode

In figure 4-20 above, a MediaLink controller connected to the IPL T S2's serial port 1 (COM1) is controlling a projector connected to serial port 2 (COM2).

Serial pass-through is enabled or disabled through the "Com Configuration" tab of a device within Extron's Global Configurator software.

NOTE *For more information about Global Configurator, see the* Glossary *section.*

Advanced users can use the pass-through SIS command as well. See the *Command/response table for Simple Instruction Set (SIS) commands,* earlier in this chapter, for detailed command descriptions.

Direct port access (ports 2001 through 2006)

Direct port access allows a direct, one-to-one connection to any of the serial ports using a TCP/IP connection. When a TCP session is initiated to port 2001 (COM1) through port 2006 (COM6), all data sent and received passes directly to and from that port without any processing. Set serial port parameters (baud rate, parity, etc.) within the IPL T unit prior to using direct access. (See "Establishing or changing system port settings", earlier in this chapter).

NOTE *The reserved TCP port numbers (2001-2006) are default assignments.*

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To initiate direct port access using DataViewer, do the following:

1. If necessary, set serial port parameters (baud rate, parity, etc.) within the IPL T unit. (See "Establishing or changing system port settings", earlier in this chapter).
2. Launch the DataViewer software program.
3. Click the TCP/IP tab on the Communication Setup dialog box.
4. Fill in the fields with the appropriate IP address and the TCP/IP port number (2001-2006), as shown in figure 4-21 below.

NOTE *A password is not required for direct port access.*

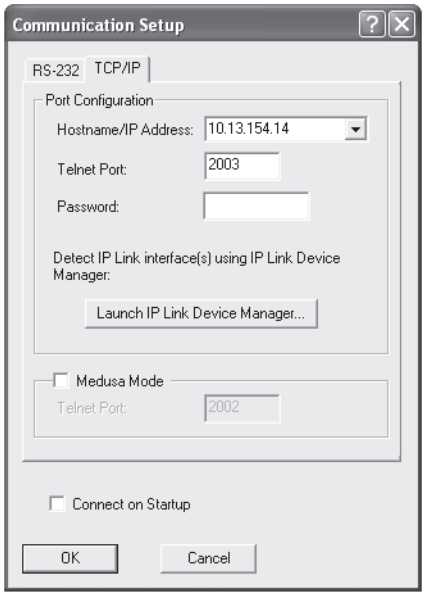

Figure 4-21 — DataViewer, version 1.1.0, Communication Setup dialog box

5. Click OK. The DataViewer commands window opens.
6. Send serial commands directly through the selected COM port to the attached A/V device.
7. To end the direct access session, close DataViewer.

NOTE *You can force the direct access session closed by logging on as administrator and entering "Esc X1 * 0CD ← ", where X1 is the selected COM port.*

Serial bridging

Serial bridging mode allows you to pass serial data between two COM ports through an Ethernet port, creating a virtual serial connection over a LAN.

To use serial bridging, two IPL T S devices (one local and one remote) must be enabled to communicate with each other, providing PC or controller access to a remote A/V device.

Hardware connection

To set up the hardware for serial bridging, do the following, as shown in figure 4-22:

1. Verify that the serial port parameters of the two devices match, as explained under "Direct port access (ports 2001 through 2006)".
2. For IPL Unit 1 (the remote device), connect a serial cable to an A/V device (e.g., a plasma, projector, etc.).
3. On the same IPL T S, connect the device to your LAN.

NOTE *See* Connecting the Hardware *in Chapter 3, for more detailed instructions on making these connections.*

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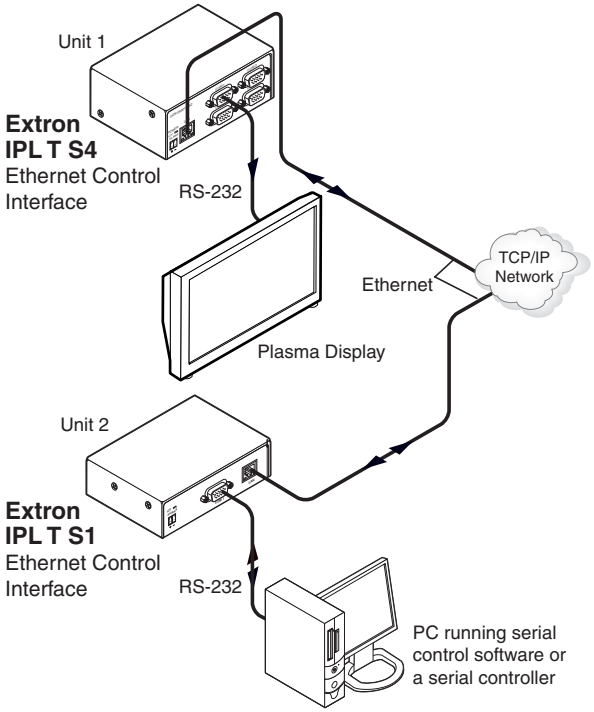

Figure 4-22 — Set up for serial bridging

4. For IPL Unit 2, make a serial connection to the PC or controller that will control the remote A/V device.
5. On the same device, follow the step 2 instructions.

You are now ready to configure IPL Unit 2 for serial bridging mode.

Serial bridge configuration

To allow both IPL units to communicate together, you must configure IPL Unit 2 to communicate with IPL Unit 1.

NOTE *If a driver was previously loaded onto your IPL device COM port(s) using Global Configurator, serial bridging disables it.*

To configure IPL Unit 2 to communicate with IPL Unit 1, do the following:

1. Enter the IP address of the IPL Unit 2 (see "IPL T S interface configuration" in chapter 3) in the address field at the top of the screen, and press the Enter key.

   The System Status page is displayed, showing the current IP and port settings of the unit.

2. Access the Web server port setting screen by clicking the **Configuration tab**, then the **Port Settings** link on the left side of the window.

   The Port Settings page appears, as shown in figure 4-23.
3. Choose the serial port that you wish to communicate through.
4. Under Serial Bridging, choose the "On" radio button to activate serial bridging mode.

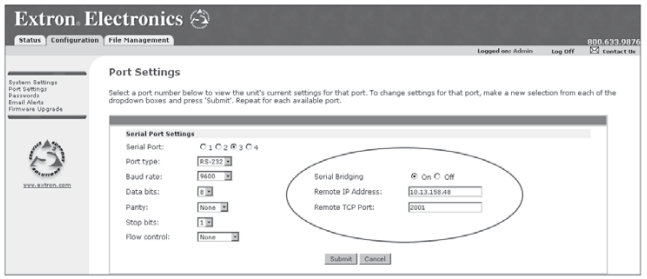

Figure 4-23 — The Port Settings page on Box 2

5. In the Remote IP Address field, enter the direct access IP address of IPL Unit 1.
6. In the Remote TCP Port field, enter the port number (2001-2006) that is serially attached to IPL Unit 1.
7. Click the Submit button.

The attached A/V device should now accept all serial commands from your PC or controller.

Troubleshooting

Turn on the output device(s) (plasma screens, monitors, projectors), the IPL T S interface, and the control devices (PC, laptop, etc.).

If the output A/V device cannot be remotely controlled, check the following:

Power connections

1. Ensure that all devices are plugged in.
2. Make sure that each device is receiving power. The interface's front panel Power LED lights if the device is receiving power.

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Data connections

1. Check the cabling connections and make adjustments as needed. The Link LEDs on the IPL T S control interface and on the computer should be solid green if a network connection is detected. If these LEDs are not lit, either the cable is faulty or not plugged in, or the wrong type of cable is being used (refer to "Connecting the Hardware", in chapter 3).
2. Try to "ping" the unit by entering "ping 192.168.254.254" at the DOS command prompt, or use the IP or Web address provided to you by your system administrator. If you get no response:
   a. Make sure your unit is using the appropriate subnet mask (check with your system administrator).
   b. Make sure your PC does not have a software firewall program that might block the IP address of the unit.
3. If contact is established with the unit, but the unit's Web pages cannot be accessed by your Web browser, verify (in the Options or Preferences menu) that your Web browser is configured for direct network connection and is not set up to use a proxy server.

If you are still experiencing problems, call the Extron S³ Sales & Technical Support Hotline.

Appendix A

Specifications, Part Numbers, and Accessories

Specifications

Parts

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Specifications

Ethernet control interface

Connectors ..... 1 RJ-45 female connector

Data rate ..... 10/100Base-T, half/full duplex with autodetect

Protocols ..... ARP, DHCP, ICMP (ping), TCP/IP, UDP/IP, Telnet, HTTP, SMTP

Default settings ..... Link speed and duplex level = autodetected
IP address = 192.168.254.254
Subnet mask = 255.255.0.0
Gateway = 0.0.0.0
DHCP = off

Web server

- IPL T S1 ..... Up to 200 simultaneous sessions
  1.25 MB nonvolatile user memory
- All other models ..... Up to 200 simultaneous sessions
  7.25 MB nonvolatile user memory

Program control ..... Extron's Simple Instruction Set™ (SIS)

Global Viewer requirements ..... Microsoft® Internet Explorer ver. 6 or higher

Serial control interface

Quantity/type

- IPL T S1 ..... 1 RS-232-only
- IPL T S2 ..... 2 RS-232/RS-422/RS-485 configurable serial
- IPL T S4 ..... 4 RS-232/RS-422/RS-485 configurable serial
- IPL T S6 ..... 2 RS-232/RS-422/RS-485 configurable serial
  4 RS-232-only

Connectors

- IPL T S1 ..... (1) 9-pin male D
- IPL T S2 ..... (2) 9-pin male D and (1) 3.5 mm captive screw connector, 5 pole
- IPL T S6 ..... (2) 9-pin male D and (1) 3.5 mm captive screw connector, 10 pole
- IPL T S4 ..... (4) 9-pin male D

Baud rate and protocol ..... 300 to 115200 baud
Default settings (adjustable): 9600 baud, 8 data bits, 1 stop bit, no parity

Pin configurations

Serial, 9-pin D (IPL T S1)

- RS-232 ..... 2 = RX, 3 = TX, 5 = GND, 7 = RTS, 8 = CTS

Serial, 9-pin D (IPL T S2, IPL T S4)

- RS-232 (default) ..... 2 = RX, 3 = TX, 5 = GND, 7 = RTS, 8 = CTS
- RS-422 ..... 2 = RX-, 3 = TX-, 5 = GND, 7 = TX+, 8 = RX+
- RS-485 ..... 2&3 (tied together) = data-, 5 = GND, 7&8 (tied together) = data+

Serial, 5-pole captive screw (IPL T S2)
COM1: pin 1 = TX, 2 = RX, 3 = GND
COM2: pin 4 = TX, 5 = RX, 3 = GND

Serial, 10-pole captive screw (IPL T S6)
COM3: pin 1 = TX, 2 = RX, 3 = GND
COM4: pin 4 = TX, 5 = RX, 3 = GND
COM5: pin 6 = TX, 7 = RX, 8 = GND
COM6: pin 9 = TX, 10 = RX, 8 = GND

General

Power ..... Supplied by an included external power supply
Alternatively, the IPL T S2, IPL T S4, and IPL T S6 can use power supplied over LAN/Ethernet (802.3af, class 2).

External power supply ..... 100 VAC to 240 VAC, 50/60 Hz, external, autoswitchable; to 12 VDC, 1 A, regulated

Power input requirements ..... 12 VDC, 0.5 A

Temperature/humidity ..... Storage: -40 to +158 °F (-40 to +70 °C) / 10% to 90%, noncondensing
Operating: +32 to +122 °F (0 to +50 °C) / 10% to 90%, noncondensing

Rack mount

- IPL T S1 ..... Yes, with optional 1U 9.5" deep rack shelf kit, part #60-190-01; or the 1U 3.5" deep VersaTools® rack shelf kit, part #60-190-20
  Also under-furniture mountable with optional kit #70-077-01 or projector mountable with optional kit #70-077-04

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All other models	Yes, with optional 1U 9.5" deep rack shelf kit, part #60-190-01; or the 1U 3.5" deep VersaTools® rack shelf kit, part #60-190-20. Also under-furniture mountable with optional bracket kit #70-212-01 or projector mountable with optional bracket kit #70-217-01
Enclosure type	Metal
Enclosure dimensions	
IPL T S1	1.0" H x 4.3" W x 3.0" D (1U high, quarter rack wide) 2.5 cm H x 10.9 cm W x 7.6 cm D (Depth excludes connectors.)
All other models	1.7" H x 4.3" W x 3.0" D (1U high, quarter rack wide) 4.3 cm H x 10.9 cm W x 7.6 cm D (Depth excludes connectors.)
Product weight	0.7 lbs (0.3 kg)
Shipping weight	2 lbs (1 kg)
Vibration	ISTA 1A in carton (International Safe Transit Association)
Listings	UL, CUL UL rated for use in a plenum air space: meets UL2043 and UL60950 for fire and smoke.
Compliances	CE, FCC Class A, VCCI, AS/NZS, ICES
MTBF	30,000 hours
Warranty	3 years parts and labor

NOTE *All nominal levels are at ±10%.*

NOTE *Specifications are subject to change without notice.*

Parts

Included parts

Included parts	Replacement part number
IPL T S1	60-801-01
IPL T S2	60-544-81
IPL T S4	60-544-83
IPL T S6	60-544-84
12 VDC, 1A external power supply (U.S., Can.)	70-055-01
12 VDC, 1A external power supply (Int'l)	70-055-02
IEC power cord	
Rubber feet (4)	
Industrial strength Velcro®	
Female 3.5 mm, 5-pole captive screw conn.	10-319-10
Female 3.5 mm, 2-pole captive screw conn.	10-319-05
Female 3.5 mm, 2-pole captive screw conn. (orange)	10-702-10LF
Tweeker	
IPL T S Series User's Manual	

Optional accessories

Accessories	Part number
RSF 123 1U 3.5" 1U VersaTools® Rack Shelf Kit	60-190-20
RSU 129 1U 9.5" Universal Rack Shelf Kit	60-190-01
VersaTools Under-Desk Mount Kit	70-212-01
VersaTools Mini Projector Mounting Kit	70-217-01
MBU 125 Under-Desk Mount Kit (for S1 only)	70-077-01
PMK 200 Projector Mount Kit (for S1 only)	70-077-04
IPA T IPA LAN Power Inserter	60-545-01

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Appendix B

Glossary

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Glossary

10/100Base-T is Ethernet that uses Unshielded Twisted Pair (UTP - Cat 5, etc.) cable, on which the amount of data transmitted between two points in a given amount of time is equal to either 10 Mbps or 100 Mbps.

Address Resolution Protocol (ARP) is a protocol that assigns an IP address to a device based on the device's MAC or physical machine address.

Custom Web page is any file that can be loaded into an IPL T S interface and served by the IPL's internal Web server. A custom Web page can provide control of devices attached to the IPL without use of Global Configurator (GC) or GlobalViewer (GV). This is true with or without an accompanying event script. Any number and size of graphics can be used, but if they are too large to fit on the IPL T S interface, you can write your Web page so that they can be served from another Web server. If you install Microsoft Internet Information Services (IIS) on your desktop, you can serve any page on its hard disk. The IPL functions like a little computer with a Web server—you can use it for various Web tasks.

DataViewer allows you to send ASCII or hexadecimal commands to an Extron IPL T S interface and view the device's responses. You can configure the data display in several ways, including selecting the text color, text font, and whether to view commands and responses in separate panes within the DataViewer window. The software can save the command/response data as a text file (.txt) or as an HTML file that preserves some of the display formatting.

Default Web pages are a set of preloaded Web pages that can be accessed via a standard Web browser. These pages are a primary means of initial setup for IP Link products and a way to change their settings. Web browsers such as Netscape Navigator (version 6.0 or higher), or Internet Explorer (version 5.5 or higher) can be used, but if using Internet Explorer, you must also have Microsoft Script (version 5.6 or higher).

DHCP is the Dynamic Host Configuration Protocol (DHCP), which is a standardized communications protocol that enables network administrators to locally and automatically manage the assignment of IP addresses in an organization's network.

Driver is a Global Configurator (GC) compatible package. It includes the event script that controls devices.

Ethernet is a network protocol that uses MAC addresses instead of IP addresses to exchange data between computers. Using ARP (see Address Resolution Protocol), with TCP/IP support, Ethernet devices can be connected to the Internet. An Ethernet LAN typically uses unshielded twisted pair (UTP) wires. Ethernet systems currently provide transmission speeds of 10 Mbps or 100 Mbps.

Event script is a program that runs on an IPL T S interface, and issues queries and commands to the attached devices. Event scripts are written in the "Extron C" language (as .sc files), and are compiled into event scripts using Global Configurator. The results are compiled as .evt files and loaded onto the IPL device. The Extron C language is similar to ANSI C, with some differences. As long as event scripts are turned on, they run on the device continuously.

Global Configurator (GC) is a windows program that, based on user input, creates the GlobalViewer (GV) pages. Global Configurator requests system information such as which devices you have and your current list of IP addresses. With this information, GC creates a GV page for your specific devices. GC also compiles the event scripts and loads the GV pages and event scripts onto the device. When using GC, the user must specify the port number for each device (for attached devices to be controlled, they must be on that port). In order for multiple IP Link devices to appear in the same GV page, all of the devices must be configured at the same time using GC.

GlobalViewer (GV) is a set of Web pages (HTML, XML, JS) and graphics that are loaded into the memory of an IPL T S interface. These pages provide an interface for control of devices attached to the IPL T S interface. They communicate with the event scripts running on the device, and the event scripts issue the commands and queries. This communication between the Web pages and the event scripts occurs through predetermined memory locations in the IPL T S interface. GV is initially created by Global Configurator (GC); however, it is possible to edit GV's HTML, XML, and JavaScript files outside of GC. This edited GV is called "hard-coded" or manually generated GlobalViewer.

HTTP is an acronym for the HyperText Transfer Protocol (HTTP), a Web protocol based on TCP/IP, that is used to fetch HyperText objects from remote Web pages.

Internet Protocol (IP) is the protocol or standard used to send information from one computer to another on the Internet.

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IP address is a unique, 32-bit binary number (up to a 12 digit decimal number, xxx.xxx.xxx.xxx) that identifies each sender and each receiver of information connected to a LAN, WAN, or the Internet. IP addresses can be static (see Static IP) or dynamic (see DHCP).

IP Netmask is a 32-bit binary number (12 digit decimal number, xxx.xxx.xxx.xxx) used on subnets (smaller, local networks) to help the router determine which network traffic gets routed internally to local computers and which network traffic goes out on the Internet.

Media Access Control (MAC) Address is a unique hardware number given to devices that connect to the Internet. When your computer or networking device (router, hub, interface, etc.) is connected to the Internet, a table (see ARP) associates the device's IP address to its corresponding physical (MAC) address on the LAN.

Pass-through allows control systems to work with the IPL T S interface, and provides a link between two ports.

Ping is a utility that tests network connections. It is used to determine if the host has an operating connection and is able to exchange information with another host.

Port number is a preassigned address within a server that provides a direct route from the application to the Transport layer or from the Transport layer to the application of a TCP/IP system.

Power over Ethernet (PoE) is a IEEE standard (802.3af) that provides power to network devices by utilizing the existing Ethernet connection, thereby eliminating the need for additional, external power supplies.

Static IP refers to an IP address that has been specifically (instead of dynamically—see DHCP) assigned to a device or system in a network configuration. This type of address requires manual configuration of the actual network device or system and can only be changed manually or by enabling DHCP.

Transmission Control Protocol/Internet Protocol (TCP/IP) is the communication protocol (language) of the Internet. Computers and devices with direct access to the Internet are provided with a copy of the TCP/IP program to allow them to send and receive information in an understandable form.

Telnet is a utility available on most PCs that allows the computer system to communicate with one of its remote users/clients. A user who wishes to access a remote system initiates a Telnet session, using the address of the remote client. The user may be prompted to provide a user name and password if the client is set up to require them.

URL encoding allows you to send information and commands to the unit to change its configuration or provide you with feedback.

Web Server resides on the IPL T S interface and provides storage of the default Web pages, GlobalViewer, and your custom Web pages.

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Glossary, cont'd

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